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AMERICAN ARTISAN and Hardware Record

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AMERICAN ARTISAN and Hardware Record

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To the frail, brave woman, whose illustrious husband was so suddenly taken away, the whole-hearted sympathy of a sorrowing nation will go out in this, her hour of bereavement.

A CASE OF MENTAL ATTITUDE AND IT'S CARE

A successful manufacturer who, in addition to his regular product, has for several years made and sold a warm air furnace of the better kind, recently made the following statement to the writer:

"The furnace business is getting toward a point where quality is of no importance—and price is all-important. The contractor-builder cares nothing about real value; all he wants is something that looks like a furnace.

"The average installer can sell only on a price basis, so he buys what appears to be low in price, no matter what the quality is."

We are inclined to agree with this man that he has some cause for complaint. There are altogether too many instances of poor furnaces being placed in new residences for the reason stated above.

There are altogether too many instances of poor furnace installations—because the installer is lacking in backbone and apparently knows nothing about selling on a quality argument.

And yet—

When you see a man build up a furnace business to several hundred installations a year in a city of less than one hundred thousand, in the face of strong competition, it does seem as if there ought to be something to the quality argument.

And more—

When you see furnace manufacturers grow from small beginnings to great enterprises, making and selling nothing but heavy, high class furnaces, it certainly does look as if there must be something to the quality argument.

True—

There are plenty of people who know little or nothing about the things that go to make up a good warm air heating plant, and who care less.

To them, price is all-important. There are, however, many people who, when properly approached, can be convinced that it pays in the long run to spend a little more and get for that sum a furnace which can be depended to stand up and to deliver sufficient heat to every room in the house.

It is because of this fact that a group of furnace manufacturers—represented by the National Warm Air Heating and Ventilating Association—are now planning to put into effect a campaign of education which will prove to the prospective house owner that it is folly to have a "cheap" installation done, and to the installer that cheap installations are a detriment to his business.

The Committee on Publicity and Trade Practices, which is in charge of this campaign has a big job, but we believe that with proper co-operation on the part of installers and manufacturers the campaign will place the furnace industry on the high scale where it belongs.

Random Notes and Sketches.

By Sidney Arnold

I made a note while at the Convention of the Ohio Sheet Metal Contractors' Association in Cincinnati to ask Joe Stermer for a picture of himself, in order that those who did not attend the Convention might see the fellow who was really responsible for the fine time that those who did attend had, but when the photo came from the studio it turned out so faint that I could barely recognize Joe's genial features.

So this story will not be illustrated.

Mr. Joseph A. Stermer, Esq., is, as many of you know, City Salesmanager of the Williamson Heater Company and also Secretary of the Cincinnati Sheet Metal Contractor's Association. He also filled the important position of Chairman of the Convention Committee. In fact, there were those who said that he *was* the committee.

Be that as it may, the committee certainly did a good job. The business program was well balanced, the addresses fine, the speakers interesting and the entertainment between the business sessions was simply excellent, notably the evening at the opera and the banquet.

Cincinnati is likely to get the Convention again—soon—and then Joe will have something more to do again.

* * *

"Judge" Werner, who has made a success of the sheet metal business down in Texas, can tell the following story without having any one suspect that he was the husband in the case (all Southerners will know why):

A married couple had engaged a cook. She was pretty as a picture, but her cooking was terrible, and one morning the bacon was burned to such a crisp as to be wholly inedible.

"Dear," said the wife to her husband, "I'm afraid the cook has burned the bacon. You'll have to be satisfied with a kiss for breakfast this morning."

"All right," responded the husband gruffly. "Call her in."

* * *

Jim Carson, who makes his home in Dayton, Ohio, is known as one of the best hardware secretaries in the country and also as one of the best story tellers. His stories always have a point to them, as the following:

Perkins, who had been convicted of theft, was brought before Judge Higgins, notoriously soft-hearted toward offenders, for sentencing. He had been well drilled by his lawyer as to the course to be pursued.

"Have you ever been sentenced to imprisonment?" asked his honor, not unkindly.

"Never!" exclaimed the prisoner, suddenly and dramatically breaking into tears.

"Well, well, don't cry, my man," replied the judge sympathetically. "You're going to be now."

* * *

"Some people have a fairly good opinion of themselves and sometimes they live up to that good opinion," said Karl Roth, of the Braden Manufacturing Company, as the Texas Ranger in the story I heard the other day.

Not so long ago a bunch of gunmen started a reign of terror in a certain Texas town, and the terror-stricken mayor wired frantically to the governor for a troop of Rangers to restore peace. A special train came down from the capital and one lonely Ranger stepped out.

"Where's the rest of the outfit?" demanded the mayor and the sheriff.

"Rest, hell," replied the Ranger mildly. "You ain't got but one riot going on here, have you?"

* * *

Gus Ruhling, who sells V. & B. hammers and chisels and other things that a fellow can hurt his fingers with, is a truthful man who would not misrepresent his goods to any one to induce an order, but he has a boon companion who likes to play poker and whose wife must be of a rather suspicious nature, judging from the following conversation:

"Women," observed the man who had just failed to better a pair of sixes, "are funny animals."

"Yeah?" absently replied Gus who was nursing along three treys.

"Yeah—no, I'm out of this pot. Yeah, if you want to get away with anything, just tell them the truth because they won't believe it. I told my wife I was going to play poker tonight and she pretty near laughed her head off. She knows blame well I've gone to a lecture at the Y. M. C. A., I'm such a darn liar."

* * *

On one of his travels about the country in the interest of the Milwaukee Corrugating Company, Phil Shelmire, who has charge of their Minneapolis sales office, stopped over night in a small country town and for want of other means of entertainment attended a show given by one of those melodrama troupes that cover the "kerosene circuit."

The town hall was packed and the village audience followed the young heroine's tribulations with breathless interest.

She was having a terrible time. In the space of five short minutes she was tied to a railroad track, narrowly escaped being dissected by a buzz saw, and had been thrown over the edge of a precipice. Miraculously she escaped every time, only to fall again into the hands of the villain.

At last it appeared that she was certainly doomed. The villain led her into a lonely cave and cast her into the presence of a huge gorilla.

"R-revenge!" muttered the villain.

"Oh, what shall I do? What shall I do?" moaned the beauteous one.

It was too much. The strain could not be borne for another minute. Up rose Phil and yelled in frenzied excitement:

"Chuck him a nut, miss!"

Dr. Palmer Discusses Modern Tendencies of Ventilation Practice.

Detroit Health Official Traces Development of Ventilating Apparatus During Past Fifty Years.

At the annual meeting of the American Society of Heating and Ventilating Engineers, Dr. George T. Palmer, Epidemiologist for the Department of Health, discussed the development of ventilating practices during the past fifty years, as follows:

One of the acknowledged difficulties in modern ventilation practice is the lack of accord of the work of the ventilating engineer with that of the physiologist and the physician. The art of ventilation has been developed to a high degree and the claim is often made that there is no condition of the atmosphere but what can be reproduced in occupied building. The actual needs of the human system as related to ventilation, however, have not been definitely specified by the public health fraternity nor by the medical profession.

"Vitiated air produces deformity, imbecility and idiocy." Thus wrote an American physician in 1850. And that is not all that vitiated air was charged with. It encourages "Pusillanimity and cowardice," "vice," "intemperance in the use of intoxicating drinks." It "produces inaptitude for study and, therefore, ignorance."

These contentions sound a bit exaggerated. Surely the most rabid open air enthusiasts, even those intrepid individuals who break the ice for a stimulating dip in midwinter, would hardly dare to be so dogmatic today.

In fifty years' time we have learned to be analytical, to separate a problem into its elements, to consider a number of possibilities before drawing conclusions. This has been made possible by an advancing knowledge of physics, chemistry, physiology and sociology. Bad ventilation is detrimental to health. This has been proved. That ventilation is at the base of all our social shortcomings is a stupendous exaggeration. It is not only untrue, but it is unnecessary to charge so many evils to bad ventilation. There are reasons scientifically sound for demanding good ventilation on the grounds of comfort, health and efficiency without going further.

Perhaps the most outstanding change in ventilation since 1870 has been the substitution of experimentation for guess-work. It is for this reason that we are vastly nearer the true causes of bad ventilation today, and we are in consequence in a better position to prescribe effective remedies for bad ventilation.

Conceptions of Ventilation Have Changed.

Ventilation, as we understand it today, has outgrown its etymological swaddling clothes. Literally, ventilation means "to air," or by fanning or blowing "to replace foul air with pure air." This definition is somewhat narrow and restricted now because in its broad meaning ventilation involves certain physical characteristics of air, such as temperature, humidity and movement, factors which the words "foulness" and "purity" do not suggest. Broadly, ventilation is the adjustment of the indoor air environment to meet the requirements of comfort, health and efficiency.

Our conceptions of the causes of bad ventilation have, it is true, changed in 50 years, but unchanged still is the belief in the necessity for ventilation. Today in many offices, schools, factories and theatres, we can experience that sensation of stuffiness, oppression, discomfort, uneasiness, which are the products of poor ventilation. These same uncomfortable feelings were well known in the '70s. They were known and described long before that time. All mankind is and has been conscious of the fact that you cannot crowd human beings into an enclosure and expect them to remain in comfort unless some provision is made for an interchange of or an alteration in the air.

The Reasons for Ventilating.

Human beings give off heat, moisture and odor. Through respiration they convert oxygen into carbon dioxide. Our ordinary habitations are not air-tight, and there is constantly taking place an interchange of air between the inside and outside, through walls and through cracks around doors and windows. This natural interchange of air is usually sufficient to maintain comfort when there is ample space and there are few people. As the ratio of people to space is increased the natural interchange of air becomes increasingly less effective in keeping down the accumulation of heat, moisture and odor. The crowding may proceed much further, however, before oxygen is diminished or carbon dioxide is increased to the point of discomfort or danger. In short, the body's ability to withstand alterations in the chemical substances, oxygen and carbon dioxide, is vastly greater than its ability to withstand changes in the physical characteristics of the atmosphere. Furthermore, the natural diffusion of the chemical constituents is much more rapid than the diffusion of heat and odor.

The internal body temperature in health is approximately constant, being maintained at all seasons of the year within one or two degrees either side of 98 degrees Fahrenheit. Although man can adjust himself to a wide range of external air temperature, there is an optimum in the neighborhood of 65 degrees Fahrenheit. This is attested to by the history of civilization, for the greatest advances have been made in the temperate zones of the earth.

In winter, man secures comfort by wearing heavier clothing, by supplying buildings with heat and conserving that heat by keeping windows and doors closed. In summer artificial heat is cut off, doors and windows are opened, and lighter clothing is donned. Practically, human comfort depends more on main-

taining a proper temperature balance between body and surrounding air than upon any other factor in the atmosphere. The ventilation requirement of greatest importance, both winter and summer, is, thus, a control of temperature within a short range of the optimum. This is a twentieth century conception of ventilation needs. As we shall show, the conception of ventilation was quite different in 1870. As our understanding of the subject has changed, so have the methods used to secure ventilation.

The Carbon Dioxide Bogey.

It is difficult to trace chronologically the theories respecting the underlying badness in used or confined air. The pendulum has swung back and forth. Before the discoveries of oxygen and carbon dioxide as components of air the mysterious poison theory was uppermost. When the physiology of respiration—the conversion of a portion of oxygen into carbon dioxide in the lungs—came to be understood, leading scientific thought seized upon carbon dioxide as the culprit. Knowing that oxygen was essential to life and that an animal would soon die from suffocation in an air tight box, it was assumed that the diminution of oxygen and the increase in carbon dioxide in the ordinary room was also harmful. This was the situation in the '70s, and as it is our purpose to trace the ventilation problem during the lifetime of the *American Public Health Association,* it is not to the point to go back of this date.

The whole thought of ventilation in the '70s was to prevent people from being poisoned by their own exhalations.

A lay writer, John Brown, expressed the popular sentiment of the time in the following sentence, "Everybody knows that carbonic acid gas is fatal, but everybody does not realize how much we suffer from the moderate doses of it which we are constantly inhaling."

This sentiment prevailed to a widespread degree through past the '80s and '90s and in fact reveals itself in the expressions of some even at the present day. It is strange how persistently belief in the harmful nature of carbon dioxide has remained in lay and scientific thought. It is like the memory of a long lost friend that will not down. The strangeness of this persistence is referred to because as far back as 1842, Leblanc show that an animal can breathe an atmosphere containing 30 per cent of carbon dioxide for three-quarters of an hour, so long as the percentage of oxygen was kept around 70, and then recover on removal to the normal atphere. Furthermore, he showed that the increase in carbon dioxide which takes place in theatres and crowded places is surprisingly slight relatively, and that the reduction of oxygen is quite insignificant.

Fifty Years of Ventilating

THIS article is the first of a series of three which embody the talk by Dr. George T. Palmer, Epidemiologist for the Department of Health, delivered at the annual meeting of the American Society of Heating and Ventilating Engineers at Chicago recently.

In this discussion Dr. Palmer takes up in chronological sequence the development of ventilating practices during the last fifty years. This article deals with the manner in which the conception of ventilating has changed and the necessity for ventilation.

In 1857, Claude Bernard performed a variety of experiments with animals, all tending to show that the increase of carbon dioxide in commonly occupied places was far below a lethal or even an irritating limit. In 1863 Von Pettenkofer proclaimed the harmlessness of carbon dioxide as it occurred in the ordinary occupied room. He did not believe that rebreathed air was a poison in the ordinary sense of the term, but he did believe that vitiated air increased susceptibility to disease. Von Petenkofer unwittingly fastened odium upon carbon dioxide by proposing the carbon dioxide test as an indication of the amount of other impurities in the atmosphere.

It is probably because the CO_2 test has become so universally used in ventilation studies that a belief in the harmfulness of the gas itself still persists.

Organic Effluvial Poison.

Carbon dioxide slowly but surely lost its adherents during the 80's. Perhaps experience had proved that its harmfulness in small quantities was unfounded. Crowded rooms still caused discomfort, and some reason for the annoyance had to be advanced. Nothing was known about "organic effluvia," and it was consequently elevated to the throne of iniquity. It was splendidly fitted for the part. It possessed an element of mystery that was tremendously satisfying. Greenleaf, a civil engineer, wrote in 1885 as follows:

"Now the best opinion is in favor of the view that the vitiating of air by human beings, so far as it is made unfit for use, is due chiefly to the organic matter given off."

Griscom had hinted at this in 1850, " . . . On the whole it would appear that sulphuret of ammonia is the morbific agent exciting typhus fever, sulphuretted hydrogen being the pestilential virus producing yellow fever, and the bilious remittents and agues of tropical climates." Griscom refers to no less an authority than Liebig as having found ammonia in the atmosphere, and he "has well nigh established the identity of malaria with sulphuretted hydrogen."

The organic poison theory of bad air found a ready champion in Brown-Sequard and d'Arsonval, who reported in 1887 that expired air from healthy men and dogs had the power of producing toxic phenomena. They injected the washings from the trachea and condensed moisture from the breath into animals, and death ensued in from a few days to several weeks. They were convinced of the presence in the expired breath of a volatile poison in the nature of an organic alkaloid.

They performed also another experiment which has had great weight in inducing people to believe in the dangers of vitiated air.

They confined rabbits in a series of tight metallic boxes connected by rubber tubing through which a constant supply of air was drawn. The animal in the fourth cage breathed the air passing through the other three cages. The third animal breathed the air of the first two, the second animal the air from the first, and the first animal received air directly from the outside. In a few hours the animal in the fourth cage died. Some time later the animal in the third cage died. The first two animals usually remained alive. Inasmuch as the air in the last cage rarely showed by analysis more than from 3 to 6 per cent of CO_2, they concluded that death was caused by a volatile poison. This belief was supported by the fact that when the air from the third cage was passed through sulphuric acid before entering the fourth cage, the fourth animal remained alive, whereas the third animal died. The acid, they said, absorbed the poison and thus protected the fourth animal.

Brown-Sequard and his colleagues succeeded in stimulating a great amount of experimentation, the results of which largely failed to confirm their findings. For instance, Haldane and Smith in 1892 confined a person in a small chamber until the vitiation was from ten to twenty times as great as in the most crowded and worst ventilated building, and yet there was no perceptible odor or sense of oppression.

Billings, Mitchell and Bergey repeated Brown-Sequard's work and were unable to secure any evidence which pointed to the presence of a volatile poison in the expired breath. For instance, six rabbits were kept in a series of bell jars for forty-two days, the proportion of CO_2 in the last two jars much of the time being from 4 to 7 per cent and of oxygen from 12 to 16 per cent. *None of the animals died or were seriously ill. "Those in the first three and in the fifth jar gained in weight, those in the fourth and sixth lost slightly in weight."* They concluded that death occurred in the latter jars of the series when the CO_2 was increased to 12 or 14 per cent and oxygen was diminished to 4 or 6 per cent. Death did not occur when the CO_2 remained less than 10 per cent unless the oxygen was reduced to below 7 per cent of the mixture. They believed the sulphuric acid did nothing more than to interpose a resistance in the circuit so that leakage of air took place around the connections to the last jar, thus reducing the CO_2 content and increasing the proportion of oxygen.

The idea that an organic poison actually exists in the exhaled breath was not by any means dispelled in 1895. In fact, as late as 1911 Rosenau and Amos believed that they could demonstrate this fact by producing anaphalaxis in animals following the injection of small quantities of condensed matter from the breath of other animals, to whose breath the animals under experiment had previously been exposed for some time. Subsequent work along this line independently by Leonard Hill, Weismann and Lucas has failed to substantiate Rosenau's claims.

Temperature and Moisture Gain a Hearing in 1895.

While there is occasional reference prior to 1880 to high temperatures and moistures as being undesirable and discomforting, the references are given half-heartedly. Heat and moisture were merely looked upon as accentuating the poisonous effects of organic matter and carbon dioxide. They were not given primary weight of themselves. In 1883 Hermans was bold enough to suggest that chemical impurities were insignificant as causes of discomfort in occupied rooms and that bad ventilation was in reality due to excessive temperature and moisture. Like so many pioneers, Hermans' voice carried little weight at the time. It was not until 1895 that the dawn of a new conception of ventilation appeared. Evidence of this is found in the refreshingly clear statements of Billings, Mitchell and Bergey. After a review of the experimental work up to that time and a repetition of much of this work under their direction they came forward with the statement that it is *"very improbable that the minute quantity of organic matter contained in the air expired from human lungs has any deleterious influence upon men who inhale it in ordinary rooms, and hence, it is probably unnecessary to take this factor into account in providing for the ventilation of such rooms."*

We cannot forbear quoting further from these authors, for their pronouncements in 1895 are so closely in agreement with our understanding of the situation today after twenty-five years of further experimentation.

"The discomfort produced by crowded, ill-ventilated rooms in persons not accustomed to them is not due to the excess of carbonic acid, nor to bacteria, nor, in most cases, to dusts of any kind. The two great causes of such discomfort, though not the only ones, are excessive temperatures and unpleasant odors. Such rooms as those referred to are generally overheated, the bodies of the occupants and, at night, the usual means of illumination contributing to this result."

They conclude from their researches that some of the theories of ventilation prior to this time were either without foundation or were doubtful and that the problem of securing comfort and health in inhabited rooms was one of preventing or disposing of various dusts, of regulating temperatures and moisture, and of preventing the entrance of poisonous gases such as carbon monoxide "rather than upon simply diluting the air to a certain standard of proportion of carbonic acid present."

We have dwelt at length on the theories of ventilation because of their importance, and we shall return to this question later on. The reader must appreciate the fact that so long as people were worried to death over a mysterious poison in the air of a crowded room and over a distressingly slight excess in carbon dioxide over that in the outside air, they could not think of ventilation except in terms of flush-

ing rooms with air so as to keep down the concentration of these supposedly evil substances. They saw poison and suffocating gas and their remedy for these supposed conditions was the proper one. They failed to secure universal comfort because in spite of ample air dilution they made no special effort to keep rooms cool.

The Service Performed by Steam Heat and the Mechanical Power.

Because the word *fail* was used in the previous paragraph, it must not be taken for granted that progress in ventilation was lacking from the 70's to the 90's. On the contrary, there were well-defined advances during this period. In the 50's and 60's steam radiators, both direct and indirect, made their appearance, and these devices taken in conjunction with the blower fans made possible voluminous flushing and aeration with tempered air which had not been satisfactorily worked out prior to this time.

To be sure, the House of Commons in England was ventilated by a crude centrifugal fan back in the eighteenth century and later, in 1846, the United States Custom House in Boston installed a steam-driven fan. But this was in the perplexing days of trial. Prior to 1870 fans were confined largely to industrial plants to remove dusts and gases. It was after 1870 that mechanical ventilation began to find its way into school buildings and larger places of assembly. It performed a distinct service, because air flushing was an improvement over conditions that had existed, and temperature could be controlled within narrower limits. School buildings, for instance, formerly depended on natural draft or warm air furnaces. Ducts were provided for supply and exhaust, but they were small and poorly located. In New York City today one can find old schools with exhaust registers 1 or 2 feet square placed in an out of the way corner, the exhaust ducts frequently being in or near the cold exposed wall with a mighty slim chance of air leaving the room through such a portal. The responsibility for this error has been laid at the door of the architect, it being charged that he was more interested in the beauty of arrangement than in the utility of the ventilating equipment. Perhaps the architect was at fault, although he may have an alibi. Perhaps the school commissioners insisted on putting those unsightly registers in an inconspicuous place. They succeeded at least. Regardless of what was at fault, ventilation did not have a ghost of a show with such treatment.

The power fan did force some air through the rooms, and a badly located register could not altogether prevent this. At times this air flow cooled the densely populated rooms, but as a rule room temperatures still fluctuated widely and overheating was all too common.

Why Ventilation Is Necessary

"HUMAN beings give off heat, moisture and odor. Through respiration they convert oxygen into carbon dioxide.

"Our ordinary habitations are not air-tight, and there is constantly taking place an interchange of air between the inside and outside, through walls and through cracks around doors and windows.

"This natural interchange of air is usually sufficient to maintain comfort when there is ample space and there are few people."

Thus, while positive air flow helped to keep down carbon dioxide and to lower temperatures, it did not insure cool rooms at all times, the cooling being purely incidental. Nor did air flushing keep down odor. As Billings pointed out in 1893, the smell of organic matter may not be perceptible when the CO_2 content due to respiration amounts to an excess of 5 parts per 10,000; and again odor may be very decided when the CO_2 does not exceed 3 parts. It depends on temperature and moisture and the amount of diffusion going on, and odors do not diffuse as rapidly as CO_2.

Air flushing alone will not always remove odors. As Pettenkofer remarked, "If there is a dung heap in a room, it must be removed. It is no good trying to blow away the smell." It is much more effective to wash dirty bodies and dirty clothes with water than with air. In warm rooms people perspire and vaporize the odorous salts and substances in body and clothes. In cool rooms odors are less noticeable.

Standards of Air Flow.

Again do we feel the urge of apologizing for our rather free criticism of the shortcomings of ventilation in the period of 1870 to 1900. As has been said, progress was measurable during this period, and against the background of the fifty preceding years it was a very marked advance. The air flow standard of 30 cubic feet per minute per person was well established at this time. Back in 1824 Tredgold, an English engineer, had the temerity to propose that a certain amount of air change was necessary and he very modestly suggested a standard of 4 cubic feet per minute per person. In 1835 Dr. Reid, who was identified with the ventilation of the House of Commons, looked upon 10 cubic feet of air as essential. In 1857 the Barrack Commissioners of England fixed upon 20 cubic feet as the proper amount. Morin (1873) regarded 8 cubic feet as necessary in schools for children under 15, and 14 cubic feet for children over 15. For theaters he recommended 25 cubic feet and the same for army barracks at night.

It remained for DeChaumont in 1875 to interpret good ventilation as demanding less than two parts of CO_2 per 10,000 above the normal. To maintain this level of 6 parts CO_2 requires 50 cubic feet per minute per person. This was the standard adopted by Dr. Parkes and many English writers. Billings looked upon 30 cubic feet as a minimum, but with provisions for increasing this to 60 should the occasion demand.

The standard of 30 cubic feet per minute per person for schools met general acceptance in this country and is incorporated in the statutes of a number of states today.

The period from 1870 to 1890 thus may be credited with giving us our present day standards of air flow, which are widely used by engineers. While superior to preceding standards, they have led us astray by focussing so much attention on air volume as to obscure the important matter of temperature and the desirable feature of fluctuation in air flow.

(To Be Continued)

Creating Furnace Repair Business When You Can Best Handle It.

As all furnace installers or repairmen know, or should know, there is a certain time during the late spring and throughout the summer when the furnace and all things in the basement of the average house are completely forgotten. The fact that the furnace needs a new grate or needs repairing in some other way has lost interest. Why worry when the sun shines, is the attitude. The furnace installer also knows that unless he makes a strong and consistent appeal for this business at a time when he can handle it to the best advantage, he is going to find himself rushed to death with furnace work when the cold weather again comes on.

There are always enough people who are rushing in at the last minute and kicking the hardest if their work is not done promptly, so why not try to eliminate as many as possible of these delinquents? For such they are.

Furnace installers are continually trying to overcome the inertia of human nature and many and various have been and are the attempts in this direction. Some have gone so far as to offer special prices on cleaning furnaces, trusting to receiving a large enough amount of work by this method to permit them to go from job to job uninterrupted and thus save time.

The accompanying advertisement is an excellent attempt in this direction. The headline has a strong appeal, while the illustration and the

Don't Delay

All of us know the "lucky fellow"—the man who seems to always have things just right. Chances are dollars to doughnuts that he's not as lucky as he is wise.

He's the kind of a chap who is having us install a

Knox Everlasting Cast Iron Smoke Pipe

to connect his furnace with his chimney. And he is having us DO IT NOW—because he realizes that we will give him the service and attention he wants—because he's assured of getting the genuine KNOX Pipe. In the fall—the "lucky guy" knows that he's running a risk—if he tries to have any furnace work, tinning or smoke pipe installed at that time.

Is This Fair?

If you could buy a smoke pipe for your furnace or boiler which would outlast ten of the kind you are using; if you could procure one which would not rust full of holes and if you could be assured that your house could not catch fire from the smoke pipe—you would buy THAT PIPE, wouldn't you?

Galvanized and Black Steel Smoke Pipe which has been in general use lasts only about two years. Rusts so full of holes that you have to buy a new one. This expense every year or two for a period of ten years amounts to quite a sum—to say nothing of the annoyance caused from having the pipe changed so often. KNOX EVERLASTING CAST IRON SMOKE PIPE is the only pipe which does not have to be replaced. It will outlast the furnace; it will not rust full of holes is permanent; and also an assurance against fires.

Why not plan now to have your heating plant cleaned and equipped with KNOX EVERLASTING CAST IRON PIPE? We can give far better service during the summer season than we can if you wait until the fall rush is on.

FORT MADISON Tinning and Furnace Co.

I. B. BRAGONIER, Prop.

1813 Des Moines St. Phone353-X

arguments in favor of using Knox Everlasting Cast Iron Pipe are very good. We should criticize the border, however, as in our opinion it has a tendency to weaken the reading matter in the body of the ad. There is no doubt, however, that the ad produced good results.

Mr. Furnace or Tin Shop Man! Have You a Unique Experience? Pass It on Thru American Artisan!

We cordially invite individually written articles from subscribers. If you have had some unusual experience which you believe to be of interest to others engaged in the same line of endeavor as yourself, put it down on paper and send it along. No matter if you can't write or spell correctly, we will take care of that. What we want is first-hand experience from men who call a spade a spade. We especially invite discussion of the articles appearing from week to week in AMERICAN ARTISAN. Due to large amount of material which comes to us weekly, we are often compelled to hold some of it over for a week or two; but we wish to assure our contributors that material which they send in will be published in chronological order of its receipt. Our aim is service to our subscribers and advertisers first, last and always, and we solicit your assistance in this most worthy of tasks.

Standard Code for Testing of Fans Is Approved by Ventilating Engineers and Fan Manufacturers.

Applies to Centrifugal as Well as to Disc Fans and in Latter Case Also to Those Used for Blowing into Pipes.

At recent meetings of the American Society of Heating and Ventilating Engineers and of the National Association of Fan Manufacturers, a code has been approved covering the methods to be used in testing centrifugal and disk fans.

As the title implies, this code is intended to establish a standard method of testing centrifugal and disk fans, and to provide a uniform basis for compiling fan performance data. Among the points covered for the testing of centrifugal fans is the arrangement of the test duct which is to have an area equal to the fan discharge and to be not less than ten diameters in length. Readings are to be taken over a plane at right angles to and the Pitot tube shall be parallel to the axis of the duct with the impact end pointed upstream. The place where these readings are taken is to be three-quarters of the length of the test duct from the fan end.

The number of readings is specified for both round and rectangular ducts, while the standard instruments for measuring pressures are the double Pitot tube and the manometer. A cradle dynamometer is recommended for all power measurements.

Under inlet and outlet obstructions, it is specified that fan performances are to be based on unobstructed inlets and outlets except for the structural features of the fan involved in bearings and bearing supports. As to the number of determinations, it is provided that eight or more determinations are to be made covering a range of performance from approximately free delivery to no delivery.

The readings of total pressure, static pressure, velocity pressure, horsepower input and speed are covered, all of them being made simultaneously. Barometer and temperature readings are also provided for, the temperature in the discharge duct to be taken as close as possible to the point of traverse. The speed is to be maintained as nearly constant as possible throughout the entire test.

Tests of Exhausting Fans.

In testing fans for exhaust pipe systems it is provided that the capacity shall be determined by readings taken in the discharge duct in the manner prescribed for centrifugal fans. To determine the total pressure there shall be provided an inlet duct having an area equal to the fan inlet and six diameters in length. The total head or total pressure is the difference between the average absolute total pressure in the discharge duct and the average absolute total pressure in the inlet duct, with additions to cover friction of inlet and outlet ducts between the points of measurement and the fan. The average absolute total pressure in the inlet duct is to be determined by adding to the absolute static pressure in the inlet duct the calculated average velocity pressure in the inlet duct. This total pressure in the inlet duct may also be obtained from the average traverse impact tube readings or more simply from the readings of impact tubes. Readings in the inlet duct are to be taken at a place three-quarters of the inlet duct length from the entering end. The static pressure developed by the fan is the difference between the total head thus obtained and the velocity head in the disk discharge duct.

Disk and Propeller Fan Tests.

The code on the testing of disk and propeller fans is framed on the basis of fans exhausting from a chamber, and all air readings are to be taken on the inlet side. As in the case of centrifugal fans, so with disk and propeller fans, the standard instruments for measuring pressures are to be the double Pitot tube and the manometer.

The test set-up for disk and propeller fans consists of an air-tight chamber of rectangular or drum form and of minimum size in proportion to the fan to be tested.

At the entrance side of the chamber is to be a duct 10 pipe diameters in length, which length includes a transformation piece to be carried to the full dimensions of the end chamber and provided with an effective diffuser.

By restriction at the inlet end of the test duct, the volumes handled are to be varied, and free delivery conditions must be procured by the

use of an auxiliary blower for obtaining zero or above static pressures in the chamber.

The capacity of the fan is to be determined by readings taken in the test ducts at the place indicated and in the manner prescribed for centrifugal fan tests. The static pressure is to be determined by a reading of an impact tube in the large chamber. Tables based on the foregoing test shall be designated for wall installation without ducts.

Disk Fans Tested Blowing.

When disk fans are used to blow into a pipe in actual service the performance is different from the performance when mounted in a wall, and consequent allowance should be made for the modified condition. Disk fans for blowing purposes are to be tested with the same standard arrangement of apparatus as described for those exhausting from a chamber, but in addition there must be placed on the discharge side of the fan a collar of the same diameter as the fan opening and one diameter long. Tables based on such tests shall be designated for installation with ducts.

Any obstruction to the flow of air such as a driving motor, pulley, bearing, framing or the like, that forms part of the unit, whether normally on either the discharge or inlet side of the fan, shall be in its designated position so as to affect the test results to show the true performance of the fan as used in that unit.

The code is accompanied by an appendix containing the derivation of the formulas used, calculation sheets for centrifugal fans when blowing and when exhausting, and a calculation sheet for propeller fans.

Bulldog Pipeless Furnace Radiator Is Made of Steel and Not of Copper.

Mail Order Furnace Advertising Contains Several Glaring Attempts to Mislead.

WITH the usual "cleverness" of the blue-sky stock salesman who tries to warp a person's judgment by citing stories about Ford, Sinclair, Gates and other successful financiers and manufacturers, one of the third or fourth class retail mail order houses of Chicago—the classification may even be unduly favorable to the company in question—makes a clumsy attempt to give the gullible persons who buy from such concerns under the mistaken idea that they are saving money, the impression that a contraption, called the "Bulldog Universal Pipeless Furnace" has a copper radiator, when, as a matter of fact, the only copper there is in the outfit is the infinitesimally small percentage contained in the steel sheets of which the upper part of the furnace is made.

Read this paragraph:

Does Copper Conduct the Heat?

"Take two pieces of wire the same length—one of copper and one of iron. Put one end of each in the fire and see which one you'll drop first! That shows one reason why we make our Heat-Ray Radiator of copper-steel alloy. After we've trapped the heat of the fire, we conduct it to the air immediately. It is estimated this material will conduct the heat more than twice as fast as cast iron. So you see why the Bulldog gives such quick results. You get all the good of your fuel and you get it instantly."

That does not look so bad, does it? No attempt to mislead, is there?

But read this description of the "radiator":

"Gable-top radiator — exclusive feature of the Bulldog—gas-tight and economically welded construction of copper, steel-alloy—durable and of great heat conductivity. The gable top shape presents the greatest amount of surfaces to the direct rays of the fire. All shine surfaces. Absolutely no dark, inefficient surfaces. Self cleaning. No accumulation of soot. The gable top radiator with its large clean 'shine' surfaces following the stream lines of the air gives the greatest possible heating efficiency."

Note particularly the comma after copper in the fourth line of the paragraph quoted. Of course, it may have slipped in by a mistake of the printer, or it may have been placed there by an advertising writer who was not any too well posted on the rules of punctuation, and it may have been "passed" by the proof-reader who "goes by copy."

But the fact remains that the impression has gone out among people who have received the catalogue describing this contraption that the radiator is made of copper.

And the suspicion comes to us that there is some one who is very careless in the advertising office of this mail order house, for the same paragraph—word for word—is used in a large "broadside" on which there are also several of the patent medicine type "testimonials," for otherwise that comma would certainly have been deleted.

And here is the best part of the proposition:

In a facsimile letter addressed to "Dear Friend," this statement is made:

"We ask you, while you are reading our book (the catalogue from which AMERICAN ARTISAN has been quoting), to please bear in mind the following important facts (?):

"First, we absolutely guarantee the Bulldog furnace to be everything we claim for it.

"Second, a twenty-five million dollar bank, the ——— (AMERICAN ARTISAN *has no desire to pillory the bank for its broad endorsement, so the name is left out*) *of Chicago has written a letter which assures you positively that you may absolutely rely upon any statement we make."*

As to the first of the two preceding paragraphs—

Does the mail order house live up to this guarantee?

Is that radiator made of copper?

Or is it made of steel with a very small percentage of copper?

If the mail order house answers

"No" to the first question, what becomes of its "guarantee" to deliver a furnace that is everything they claim for it?

For in the paragraph quoted from the catalogue and which also appears in the "broadside," the definite statement is made that the radiator is made of "copper, steel-alloy."

If on the other hand, it was their intention to state that the radiator is really nothing more or less than several pieces of steel sheets with a very small percentage of copper—

Why does the mail order house allow a description to be published and sent all over the country, which can and does cause the impression that the radiator is made of copper?

After all, however, the main point for the regular furnace installer is to know that nobody can make and sell a furnace that is capable of giving sufficient heat and lasting service unless his price is practically what the regular installer asks—no matter what ridiculous claims may be made.

Honeywell Stages Attractive Automatic Aerofan Display at Hotel Gibson, Cincinnati, During Sheet Metal Convention.

Furnaces Fully Equipped Showed How Honeywell Method of Induced Warm Air Circulation Operates.

IN our issue for July 21, 1923, we published a complete report of the Ninth Annual Convention of the Ohio Sheet Metal Contractors' Association, including the report of the proceedings of the Salesmen's Auxiliary meeting.

It would indeed have been an oversight had not some mention been made of the splendid displays which were staged in the Hotel Gibson during this convention.

The accompanying illustration shows how the Honeywell Heating Specialties Company, Wabash, Indiana, prepared for the visitors, and the firm certainly deserves commendation upon the completeness of this display. A. P. Mudgett and M. Honeywell were in charge of the display.

The furnace seen in the left side of the illustration was loaned by the Williamson Heater Company, Cincinnati, Ohio. To the right of this heater is seen the Honeywell Individual Dust Aerofan which is automatically controlled. Honeywell Temperature Regulators are also seen on the tables.

In the illustration on the right the furnace is a Sunbeam, manufactured by the Fox Furnace Company. It was loaned by the Niehaus Furnace and Stove Repair Company.

This display shows how the Honeywell Method of Induced Warm Air Circulation is operated. This system is entirely automatic. On the table to the right of the furnace is seen two galvanic glass jars. These jars, due to the heating and cooling of the water contained in them, control the operation of the fans. A Honeywell Temperature Regulator is also seen here.

This is a very good display of the Honeywell products and the work which they perform in adding to the convenience and comfort of the furnace owner.

A great many people will for a consideration advise you how to conduct your affairs, but they will not guarantee their advice to be wise. If they had absolute knowledge they would act for themselves and because of their prescience gain great rewards. No one would serve as an intermediary if he could absolutely foresee the future and so in all affairs of life one must not depend too much upon soothsayers, astrologers or even statisticians.

Display of Furnace Accessories Made by the Honeywell Heating Specialties Company, Wabash, Indiana, Arranged in the Hotel Gibson, Cincinnati, Ohio, During Ohio Sheet Metal Contractors' Convention.

Design and Pattern for Tomb Ornament Which Shows How Chamfer Grows Out of Stem and Works into Base.

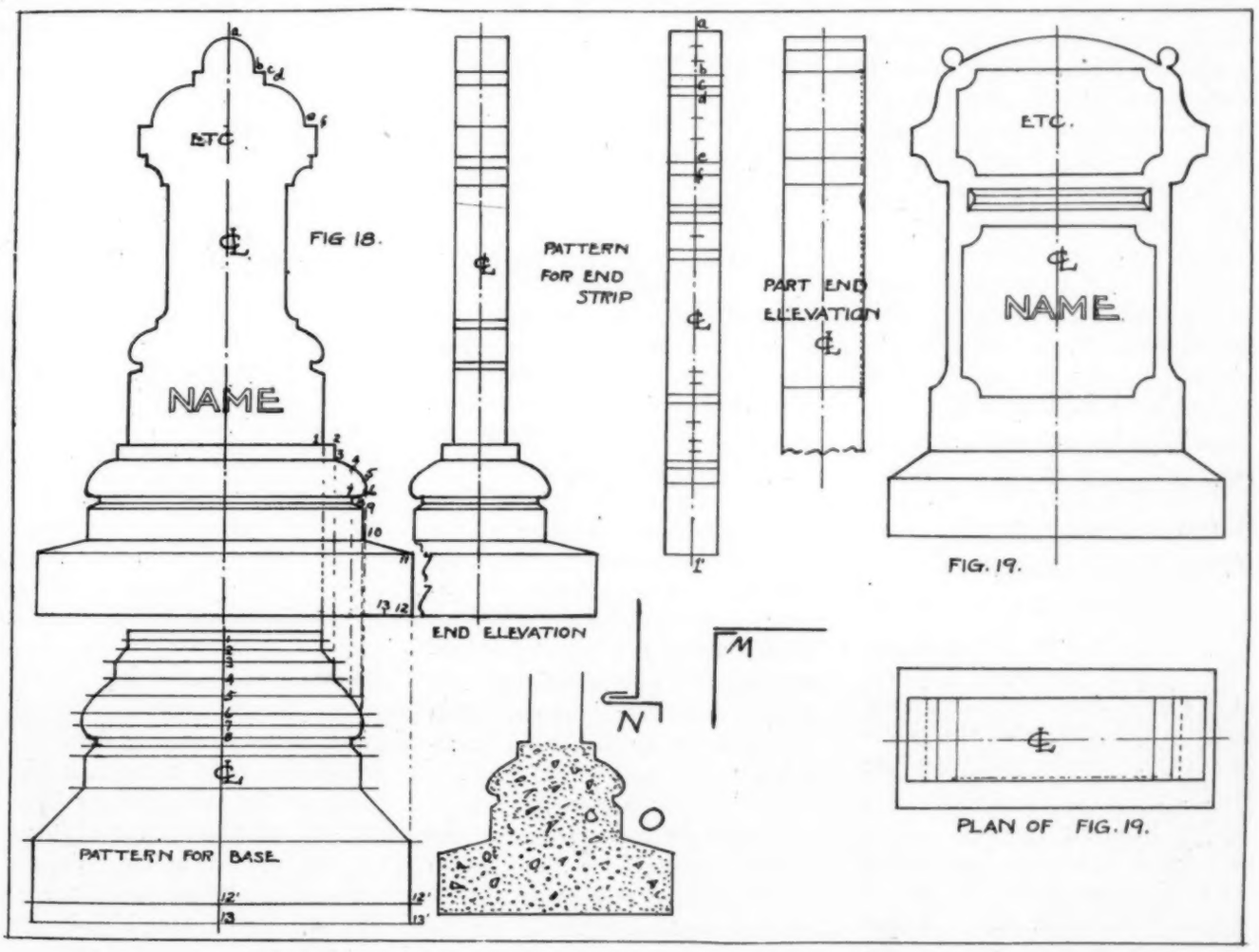
Shows How Stem Is Made Complete from the Base to the Top and Cross Arms Are Planted on.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by O. W. Kothe, Principal St. Louis Technical Institute, St. Louis, Missouri.

IN FIGURE 20 is shown a design where the stem of the cross transforms and becomes a mold chamfer and works out into the base. Observe the section B of the stem of cross where the lines are placed diagonally and this will make a pattern similar to that shown in the pattern for cross arm. The stem is made complete from the base to the top and the cross arms are planted on.

In the enlarged details for chamfer is shown just how the chamfer grows out of the stem. Section M represents the stem and the moulded portion below of the base working out. Then at e-f we have the modified section from which the girth is obtained to develop the pattern. Observe that we divide the curved line 1-8 in our enlarged elevation and square up points to the plan, following up the lines so that they are parallel with the side of the stem. At right angles we draw the line b-c, which gives the true widths of the projection of chamfer between spaces. As the elevation gives the true rise between the spaces, so we pick these points from b-c and set them off on the line e-f. Then by squaring the line back and forth as shown, the modified section is developed. From this we take the girth and set as 1′-8′ and develop the pattern picking the spaces from the plan cross line b-c.

At the same time the patterns for the caps of the cross may be developed by letting h-t be the rise of cap, which will make h-a as the radius. Set the dividers to this radius and develop the pattern for top as shown. To set out the pat-



Working Drawing Illustrates How Metal Tomb Ornament is Constructed.

tern for the base, we divide all curved lines from 12 to 22 in equal spaces, numbering each point and bend. From each of these points square lines to the center line and then pick this girth from elevation and set it off on a straight line as 1-22. Pick the half widths from the elevation and set over as 1-1′; 2-2′; 3-3′, etc. This enables tracing the miter line for pattern.

This base must, of course, be reinforced by several cross partitions placed square to each other and then filled with concrete to give it weight and to protect the metal from being abused, causing it to buckle up or stretch out of shape. It should be mentioned that all soldering should be placed on the inside and where this is not possible the solder should be scraped off very smoothly, leaving only the copper or brass exposed. In order to dispense of the little spots that are quite hard to work out, the workman should mix a solution of blue stone with water and apply the solution with a brush; the solution will copperize the solder. It is, however, much better if all the joints can be welded.

Handy Galvanized Sheet Weight Indicator Issued by Inland Steel Company.

In order to minimize the amount of handling of their products, the Inland Steel Company, Chicago, have worked out a handy little sheet gauge which eliminates the necessity of repeatedly weighing the sheets.

The indicator consists of a card upon which are printed the sizes of sheets from 10 to 30 gauge. The width, length, weight per sheet, weight per bundle, number of sheets to bundle are so arranged upon the card as to permit the clerk, by sliding the card up or down within the folder, to have at a glance the desired information.

For further information and specimens of this handy little indicator of galvanized sheet weights write to the Inland Steel Company, Chicago.

Bonbrake Outlines Ten Causes for Leakage and Tells How to Repair Slate and Composition Shingle Roofing.

Shows How Asbestos, Asphaltum and Cement Roofing Plates, Having Their Length Double Their Width, Can Be Repaired by Same Method Used on Slate Shingles.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by L. S. Bonbrake, County Hospital, Peoria, Illinois.

ANY one of the several composition shingles offered the trade as asbestos, asphaltum and cement roofing plates, having their length double their width, can be repaired by the same method as is used for slate shingles, just as easily and thoroughly; hence we will continue as for slate in reference.

We have found ten prominent causes for leakage during an active participation in this line for many years, which are fully described in the following:

On account of weight per square, slate must be bought in carloads at the quarry to get a freight rate that will deliver the slate at a price that will return an equitable profit. For this reason many sheet metal workers do not keep shingles or have the tools for repair work. However, in many cases they are anxious to serve a regular patron by doing this class of work, and keep an outsider from encroaching on their domain. For such craftsmen we herewith describe an outfit of tools that will answer every purpose, which can be made by any good blacksmith.

The Hatchet.

Usually a lather's hatchet is preferred, yet any one of medium weight that may be selected will answer. The blacksmith can weld a pointed tong upon the front corner, and make a suitable two-pronged device that can be inserted into the end of the handle and secured by a ferrule for pulling nails. This will complete a handy tool with all the necessary attributes. The drive, nail puller, punch at tong for nail holes and a slate cutter along the blade of the hatchet. Also a creaser for splitting composition shingles can be made by grinding down the heel corner of the hatchet to a one-quarter inch, sharp edge. This heel cutting edge can be drawn along a "straight edge" until the line or groove is deep enough, so that the shingle will part nicely by tapping it.

The Ripper.

For convenience an old buggy spring leaf can be used, as it is already tapered to a thin edge at one end. The front or thin end is shaped into a crescent or half-moon form, and sharpened to sever a nail on both the inner and outer edges. The ripper is usually made eighteen or twenty inches long, and is very necessary in removing broken or damaged shingles.

It is pushed up under the shingle to be removed until reaching the two nails (one at each side edge of shingle) about 8½ inches from the butt of the shingle when they are twenty inches in length; ten a half inches if twenty-four inches long. When found, one of the prongs is hooked around the nail and the ripper is driven back down the roof by hammering upon a one inch offset made on the end of ripper handle for this purpose. If the shingles lay too tight on the roof to use the inner cuting edges, sever the nail with the front cutting edge by driving upward.

The Stake.

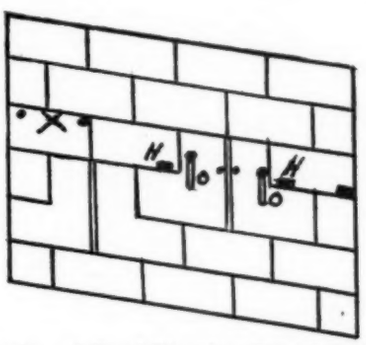
Is used more especially for laying slate and asbestos shingles upon, for cutting or grooving to a true line. Cutting miters for hips, valleys, flashing around chimney, etc. The stake can be made by welding the shank end of an old file to a piece of bar iron ⅛ x 1 inch and 10 inches long. A file is appropriate

for the shank as it already has a pointed end, that when sharpened can be "rocked" into a rafter, the sheeting or any convenient wood and will stick where put.

Replacing one broken shingle (figure 1) indicates a section of roofing having two damaged shingles removed by the process described, with the ripper. The new slate is pushed up under the shingles of the row above until its lower end lines up with the butts of the row of shingle it will fill out. It is then nailed at the immediate end, hugging the butts of the shingles above, as shown by two dots on slate X. The nail heads will be exposed until covered with glazier's colored putty or a mixture hereinafter described. Nailing the last slate from the top in repair work, as above noted, is the method generally used by slaters in the United States. We have used this plan for a great many years, have found it permanent and secure and is especially adapted to any location having severe storms and high winds. However, we have noticed occasionally where the last shingle or shingles of repair in the body of a roof was secured by the old English method of laying slate roofing, Figure 1, at H H, one inch strips of galvanized iron or copper "o, o" are nailed three and a half inches above the butts of this row of shingles. These strips will be located under the new shingle, to be tapped into position, and extending below the lower end ¾ inch; the extension of the strips are turned up sharply against the butt of the new shingle, then pressed over and down upon it, forming a cleat for security in holding the shingle in place without nail through. (See H H.) The same method is used in repairing a damaged area of considerable extent, caused by a falling chimney, broken limb from a tree or other unavoidable accidents, as in one broken shingle, except when the damage extends down the roof for several courses; the top course of the damaged space can be taken out in the way described for one broken shingle, after the top row has been removed the nails of the row under can be pulled with the hatchet and continue on down, row by row as far as needed. When all the damaged pieces have been cleaned up, relay in the usual manner until reaching the top row to be replaced. Secure this row by either method desired, X or H. (See illustration.)

Roof Gutter Renewal.

Usually the eave course of shingles and the first row laying over it, are all that is necessary to remove to get the old metal out and replace with new. Care should be exercised in removing the shingles, as they can be relaid by punching new nail holes. The manner of



Section of Roof Showing Two Broken Shingles Taken Out. X Shows American Method of Fastening. H H Shows Old English Method.

their removal has been made clear in treating a damaged area. A wood strip or plastering lath is necessary under the bottom edge of the eave course for the purpose of elevating that edge slightly, to give the shingles the proper front elevation, in order to have them lay firm, without rocking throughout the roof. As a general rule these wood strips or lath are nailed through the gutter metal into the sheeting which is vitally wrong. Every precaution is taken by a good tinsmith when laying a gutter to have its back edge higher than the front, in order that an overflow, if any, caused by a plugged water pipe, or the water dammed in the gutter, after a freeze up, must go over the front and not into the building. Nailing the lath through the metal renders this calculation nil, as the expansion and vibration of the metal will cause the nail holes to enlarge and become a prolific source of leakage, showing upon the ceiling near the outer walls. To prevent this, nail one inch galvanized iron strips near each end of the lath and nail the opposite end of the strip above the top of the metal gutter, then the lath cannot slip down. The origin of leaks encountered in the roof of a building are frequently hard to trace. Occasionally by going into the attic a lead can be found to the leak in the form of discoloration, a streak on a rafter or possibly light shining in, and again the valley metal may have buckled down between the spaced wood strips to which the shingles are nailed. At least a search there may lead to near the source of trouble. Then, painted tin strips three inches wide or thereabouts, can be pushed up under the shingles (from outside) to the nails above, centering each seam for a considerable area around the supposed location, when the leak will quite often disappear.

Leaks Around Flashing.

One cause of mysterious leaks has been due to allowing the end of weather boarding to touch the bottom of its metal flash of an abutting roof. Water flowing down the metal flashing of the roof can very easily catch onto the top edge of the weatherboard, when it extends too far over the flash. The water frequently creeps along the top of such a weatherboard until it reaches an obstruction, such as a stud, when its course will be diverted downward. Then possibly some other obstruction again changes the course of the water so that when it eventually shows up on the ceiling or wall, the source of the leak may be hard to find as it may be located at a considerable distance from the point where the water appears inside of the building.

A leak of this character may be entirely avoided by seeing that the ends of the siding are kept well back from the bottom or water channel of the metal flash, usually tin shingles.

Another cause of leakage is due to the fact that soot and dirt blowing into the corner of the metal

flashing at the point of contact of a shed roof abutting against the side of a weatherboarded building and is held there when the siding fits down close upon the flashing. By the action of the weather the accumulated soot will turn to an acid, which will eat through the metal in short order, reducing the metal to a mass of rust, necessitating taking off the lower siding to remedy the connection.

This trouble may be prevented by not dropping the siding down close to the bottom of the roof flash. A ½-inch space at least is advised, left between the bottom edge of the board and the bend or corner of the flashing. This will allow the soot and dirt to be brushed from its lodgment and will also permit painting the metal, which will assure its longevity.

Repairing Valley.

It is a notorious fact that more leaks are caused in valleys, as in gutters, by careless, haphazard nailing than from all other causes. We have removed shingles along the valley numerous times when hunting for leaks and have found nails driven through the valley metal right up to the valley line. It will be observed by any one giving the matter attention that during a snow storm or even a slight flurry that snow will accumulate at the bottom end of the valley first; if this turns to slush and freezes, the first thaw will find the water creeping around under the shingles and will seep through at every nail driven through the metal near the valley line.

To prevent this leak keep all nails as far back to the outer edge of the valley metal as can be; rather than drive a nail through the valley metal near its center, we should let that spot be uncovered.

Water can be barred from seeping under the shingles of an old valley by making and using the following mixture: For an ordinary valley, to three pounds of oxide of iron add coal tar and mix thoroughly until the whole becomes a comparatively dry mass; to this add boiled linseed oil slowly, and mix until it is the consistency of glazier's putty. Thin a portion of this mixture and paint the valley, also the shingle edges. Then use a small trowel or wood paddle to apply the mixture along the edges of the shingles and connect with the valley metal. Smooth over the mixture as applied with a damp paint brush. You will then find the valley water-proof.

Leaks at dormer windows are occasionally found at the comb when the metal ridge cap or roll has not been closed on the end abutting the main roof, also at times the valley metal covering the comb has been carelessly cut and overlapped; water from the big roof comes rushing down and striking this end of the dormer comb forcefully making it necessary that special care be taken to have the comb and valley fittings absolutely water-tight. Black slate shingles split lengthwise while green split crossways and cracked slate are looked for coming that way.

Peck, Stow & Wilcox Hold Annual Outing at Hanover Park, Meriden, July 28.

The big plant of the Peck, Stow & Wilcox Company, Southington, Connecticut, shut down as tight as a drum on Saturday, July 28, for the purpose of giving the day without interruption over to the Company's Big Annual Outing for its employes.

To the strains of the Meriden Military band ten double truck electric cars and a fleet of automobiles were loaded to capacity in an orderly way for conveying fifteen hundred adults and five hundred children to Hanover Park, Meriden, where the outing of the Peck, Stow & Wilcox Company, of Southington, was held.

This annual outing has been given by the Company without interruption for several years past, having always proved successful affairs and are looked forward to by the Company's employes and their families with a great deal of anticipation and pleasure.

In addition to the Military band, which was engaged to furnish music on the cars and at the park, a seven-piece orchestra provided music during the entire day for dancing.

The great features of these outings are the athletic events, this year's schedule being as follows:

1. Baseball game between office team and factory team. Prize, $10 in gold.
2. Tug-o'-war—Office vs. Factory Girls. Prize, 5-pound box candy.
3. 100-yard dash for men. First prize, Waterman fountain pen; second, pencil.
4. 50-yard dash for fat men. Prize, umbrella.
5. 50-yard dash for boys 12 years and under. First, fielder's glove; second, pocket knife.
6. 50-yard dash for girls throughout plant. First, pendant; second, beads.
7. 50-yard dash for girls 16 years and under. First, bracelet; second, lingerie clasps.
8. Egg race for girls. First, bar pin; second, earrings.
9. Standing broad jump. One set of cuff links.
10. Nail driving contest for girls. Toilet set.
11. Collar and tie race for girls. Silk stockings.
12. Potato race for all throughout plant. Men's prize, 2 pairs silk socks; girls' prize, 1 pair silk stockings.
13. Ball throwing contest for girls. Vanity case.
14. 50-yard dash for men 50 years or over. Umbrella.
15. Pie eating contest. First, $1.00; second, 50 cents.

After all games had been disposed of and prizes awarded, a part of the day was given over to indulgence in such pastimes as free boat rides and other attractions of similar kind that are found at a big park.

The committee in charge of the outing is to be congratulated for the manner in which they handled so large a crowd and provided for their entertainment. Everyone who attended had a good time, and all returned home without mishap.

Thoroughness Is the Lubricator That Makes the Business Machine Go, Says Greenberg.

A Lack of Thoroughness Is Bad Because it Causes the Innocent as Well as the Guilty to Suffer.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by J. C. Greenberg, Cleveland, Ohio.

I WAS over to Bill Fisher's home for dinner one Sunday evening, and we chatted a lot about different things. I do not like to talk shop on Sunday. Our talk was somewhat scrambled, so to speak. First about one thing and then another. Finally we got to talking about children and schools. As we were discussing this subject, Bill arose and went into another room, returning with a slip of paper in his hand. He was smiling as he approached me and said:

"I just want to show you how kids are," handing the slip to me. "Here is an arithmetic paper that my boy's teacher sent to me, together with a note saying that he did not do his examples, but just put down any figures to represent the answer. She wanted me to talk to him about it and instruct him to be more thorough in his work."

"Did you?" I asked.

"No, sir, I did not," replied Bill "The kid is a chip off the old block. I well remember that I did that same trick myself when I was in school. Gee! Kids will be kids. There is no use in scolding my boy. He will get by as well as the rest of the kids."

"Bill," said I, seriously, "you are making the greatest mistake of your life in this matter. It is not a matter of doing a cute trick; it is as the teacher has told you. It is a matter of thoroughness. Unless you teach your boy to be thorough in all things, he will lose out in later years. 'Spare the rod, and ruin the child.'"

"Oh, kids will be kids," said Bill, indulgently.

Now, Bill was wrong. I wanted to teach Bill a lesson that he had missed earlier in life. So I said in a serious mood: "Bill, you are as wrong as you can be. Let me just show you that you have lost out just because of this lack of thoroughness."

"Let her go," said Bill, jokingly.

"You said a while ago that your boy is a 'chip off the old block,' and that you did the same thing in school yourself," said I. "I just want to show you how it reflects on you and your business to this day, and that you are not wise to your own lack of thoroughness. When I called on you yesterday, a customer called up and asked you when you would call over there and do that job. You told her politely that you had no time, but that you would be over Tuesday maybe. Is that true?"

Are You Thorough or Lax in Your Work?

DO YOU do business in a slip-shod or thorough manner?

Thoroughness is the grease that makes the machine go.

Just look around in your shop, and you will see many things that are only half done or hanging fire.

Wade through your work in a thorough manner, and always remember that each "tomorrow" has its own problems and you cannot leave "today's" work for tomorrow.

"Yes, it is. I remember that clearly," replied Bill.

"Very well, Bill," I continued. "You knew full well just when you could get over there, but your lack of thoroughness kept you from allaying that customer's anxiety. This is poor service. Am I right, Bill?"

"I guess you are right," admitted Bill, smiling.

"All right," I went on. "Just after you gave me that order yesterday, a man stepped in and asked you why you did not get over to finish that job he gave you, and you said that you were sorry, but you had overlooked it. That was a lack of thoroughness, and it hurt that customer's felings. You could have been more thorough and had this job all finished, and the customer would have had satisfaction. Is that true, Bill?"

"Quite true," admitted Bill, but he was not smiling this time.

"You told me just before I left yesterday that you would call me up in the evening to make arrangements for today. I waited in my room till ten o'clock for your call, and then retired with a disappointed feeling. You did not call until this morning. You took a chance on finding me in. If I——"

"Holy smoke," interrupted Bill, "I hope you are not offended at this little slip-up."

"No, I am not offended," I replied, "but it showed a lack of thoroughness on your part."

Bill did not say a word.

"Do you know, Bill," I went on, "that you owe us a bill which has lost you four dollars in discounts? Do you know that you have lost the discount privilege?"

"Doggone it, you are right about this," shouted Bill, nearly jumping off his chair. "I intended to send a check Saturday, but just overlooked it."

"Yes, Bill," said I, "you mean well, but you are not thorough enough for a business man. I am not kicking about that bill; I am merely showing you what it means to let your life be guided by a habit of neglecting to be thorough."

"Gee, but you are sure right," said Bill, slowly.

"Of course I am, Bill," I agreed. "Take the last time I was here, when Manley came in to see you. You supposed that I did not know what he wanted, but I knew all right—"

"You do not know a thing about it," replied Bill, with impatience.

"The devil I don't know," said I, laughing. "Manley is the teller of the bank across the street from your shop. I know him because he cashes my checks. Now, Manley has no business in your shop, except when the bank is concerned. I suppose you were overdrawn, and he

came in to put you next. What else could he possibly want in coming into your shop?"

"You are right, old friend," admitted Bill. "That is just what he came in for. He is a friend of mine all right."

"No, he is not your friend in this case. He is a friend of his bank—that's what he is. It wasn't *you* he wanted to protect, it was *his bank*. Now, I know that you have money, and could have made it good any time, but you were not thorough in your business. It is poor business—yes, damn poor business conduct."

"Gee, old man, you are sure showing me some faults of mine," said Bill, seriously.

"Just a single fault, Bill," said I. "Just that miserable and ruining fault that makes men fail in business. A lack of thoroughness is worse than anything, because everybody who comes in contact with you suffers. Bill, be more thorough, and for the love of Mike, teach your boy to be more thorough. That school slip you showed me is just exactly where you have started to become lax in thoroughness and it reflects in your business this moment. You may call your boy a chip off the old block, but the old block is a poor stick. Don't be proud of the little incident that may sway the life of your boy. Make him thorough, and when he becomes a man he will be a better man than you are by far."

Never mind what else Bill said, and what I said after the last quotation marks, but just you, dear reader, place yourself in Bill's position and let us go ahead. Are you thorough, or are you lax? Do you do business in a slip-shod manner, or do you do business in a thorough manner? This is important, indeed. Thoroughness is the grease that makes the business machine go. Just look around in your shop, and you will see many things that are only half done or are hanging fire.

Wade through your work in a thorough manner, and always remember that each "tomorrow" has its own problems and that you cannot leave for tomorrow "today's" work.

If you will just read this article over several times, and study it, you will find many places where you have been guilty.

Just stop and think.

Joint Directors Meeting Held by Indiana Sheet Metal Contractors and Fur-Mets.

President A. W. Dudley, of the Indiana Association of Sheet Metal Contractors, took advantage of the invitation of President Paul Jordan of the Fur-Mets Association, to issue a call for a joint directors' meeting which was held recently.

The following officers and directors were present:

President, A. W. Dudley, Terre Haute; Secretary, Leslie Beach, Richmond; Director, W. A. Brown, Marion; Director, John Balkema, La Fayette; Director, W. S. Waters, Indianapolis; Director, John C. Kreidt, Ft. Wayne; Vice-President, Joseph Mattingly, Indianapolis; Edward A. Gardner and John Lauck, Jr., of the entertainment committee.

President Dudley appointed a convention committee to handle the coming state convention, consisting of Joseph Mattingly, Chairman, W. S. Waters and Joseph Gardner. The convention will be in Indianapolis, probably the latter part of next January.

Joseph Gardner, Vice-President of the National Association of the Sheet Metal Contractors, was present and brought before the board the necessity of continued activity in the securing and holding of members of the National organization, through the state organization.

Fur-Mets Meet Also.

The Fur-Mets Board of Directors met also. There were present:

President, Paul R. Jordan, Indianapolis; Vice-President, F. L. Canine, Crawfordsville; Vice-President, F. A. Wilkenning, Indianapolis; Secretary, O. Vorhees, Indianapolis; Treasurer, John Henley, Indianapolis; Philip Geitz, Indianapolis, Director; E. W. Norman, Indianapolis, Director; Ralph Ingalls, Indianapolis, Director; George Thomas, Indianapolis, outing committee; Rolland Wilcox, Indianapolis, roster committee.

Letter from Secretary Seabrook.

A letter from National Secretary Seabrook to President Jordan, of the Fur-Mets, suggesting that his organization might lend valuable aid to the national organization in boosting its Indiana membership, was read. The board agreed that while the individual members of the Fur-Mets might, and would be glad to do what they could for the National Association as individuals, the Fur-Mets organization has a definite policy of not entering into any Association activities, as an organization; they will then continue to keep the divorcement of the two organizations complete.

Roster to Be Completed Soon.

The roster committee reported that a complete and valuable roster was on the press and expected out within a few days. The roster will carry a number of tables of constant use to sheet metal contractors, so that it will be kept for reference permanently. The roster is printed primarily for the use of the members of the two organizations, but the board voted to have printed, enough extra copies to take care of requests for copies for prospective as well as present members of both organizations.

After the meetings adjourned, sports were in order, consisting largely of swimming, canoeing, horse shoes and a large measure of good fellowship.

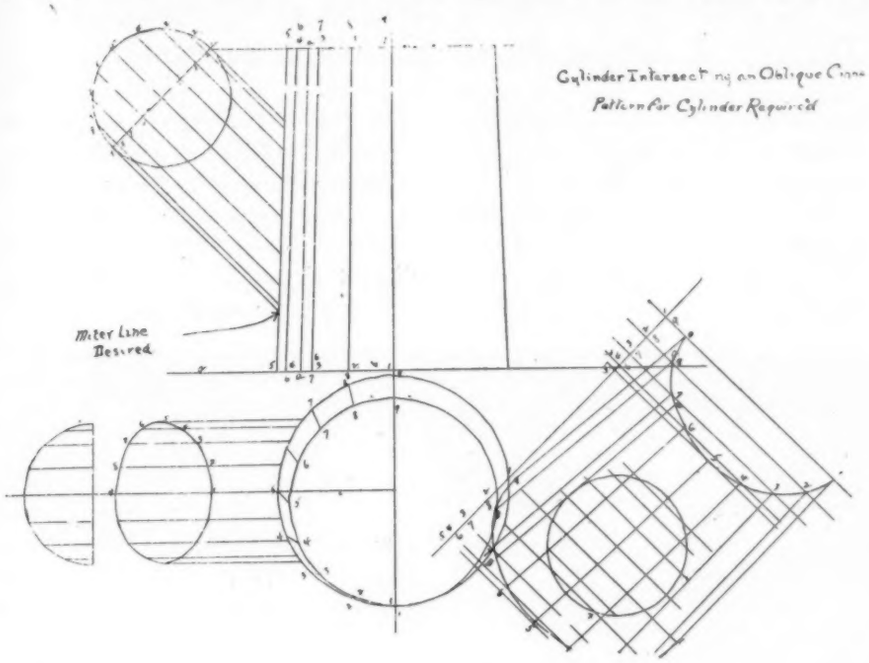
At dinner time, the cook divided the responsibility by making every man cook his own wieners and frankfurters over the bon-fire, which furnished considerable fun and sharpened the appetites of the cooks.

After dinner, a smoker and cards furnished a background for an evening of informal conversation, made up largely of the joking and kidding that this bunch habitually indulges in.

Give the world the best you have and the best in life will be your reward.

Yes, We Have Some Patterns. Difficult Problem Encountered by Koeberle-Heyer Company.

Koeberle - Heyer Company, of Iowa, have mailed us a problem in pattern cutting which they would like to have solved. The accompanying illustration gives the requirements.



The letter from Martin C. Koeberle is as follows:

To American Artisan:

We are mailing you a problem in pattern cutting which we are submitting to you for a simple solution, as we expect to use this pattern in a blow pipe construction at various times and the principal involved in this solution will be used in this work. Perhaps Mr. Kothe or some other cutter can help us solve this interesting problem.

Martin C. Koeberle.

—, Iowa.

W.E.Born,Davenport,Discontinues Hardware Store; Devoting Himself to Sheet Metal and Furnace Shop.

W. E. Born, 418 West Second Street, Davenport, Iowa, who has conducted a retail hardware store at this location for a number of years, has discontinued his retail hardware store and is devoting his entire time to his sheet metal and furnace shop.

Should the Dust Collector Be Over or at the Side of Boilers?

The following inquiry was received from Wieseke & Schumacher, of Watertown, Wisconsin:

To American Artisan:

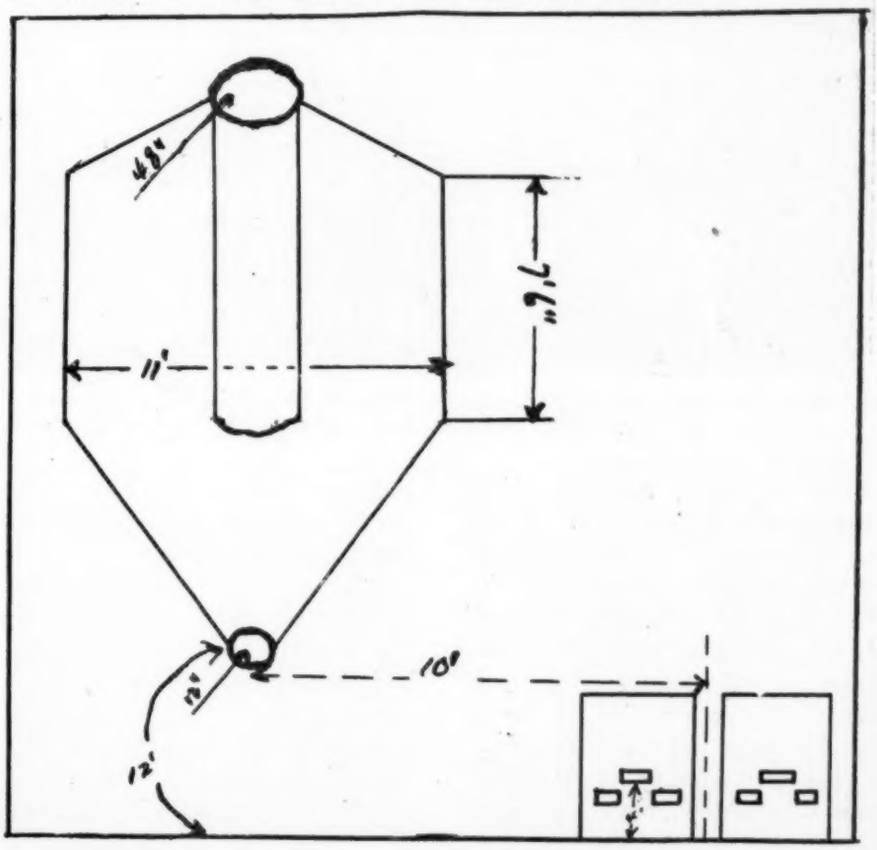
We have mailed you a sketch of a dust collector.

Kindly advise us whether or not this collector can be connected to feed the boilers as shown on the diagram or if it should be moved over and placed above the boilers.

The dimensions of the dust collector are here given, the inlet being 28 inches and the outlet 48 inches. We do not think this is large enough, as it blows the shavings out.

Please send us a sketch or recommend a firm we could write to about this.

R. F. Schumacher.



G. B. Horsfull Joins Sales Force New Jersey Zinc Company.

G. B. Horsfull has joined the sales force of the New Jersey Zinc Company at New York and will travel in the eastern territory.

Notes and Queries

Lawn Mowers.

From DeWeese Radiator and Repair Shop, Fort Wayne, Indiana.

Can you tell me who makes the Winner, Standard and Boulevard lawn mowers?

Ans.—All private brands manufactured by Dille and McGuire of Richmond, Indiana.

Silverware and Dinner Service Window Display That Requires Little Further Garnishing of the Food to Make the Meal the Best You've Tasted.

H. F. Westcott and John Niemi Make Mouths of Houghton, Michigan, Citizens Water with Display Arranged for I. E. Swift Company.

IT IS a rare person indeed who can pass a window display of silverware without appreciating the aristocratic richness and beauty of the dazzling display before him.

Our artistic sense demands to be fed and it responds very quickly where the display deals with things having to do with our diet. If this were not true, then why would the housewife search continuously for new ways of garnishing our food before placing it before us on the table? How much better the meal tastes when placed before us on spotless linen and rich silverware!

The accompanying illustration is that of a window display arranged for the L. E. Swift Company, Houghton, Michigan, by H. F. Westcott and John Niemi.

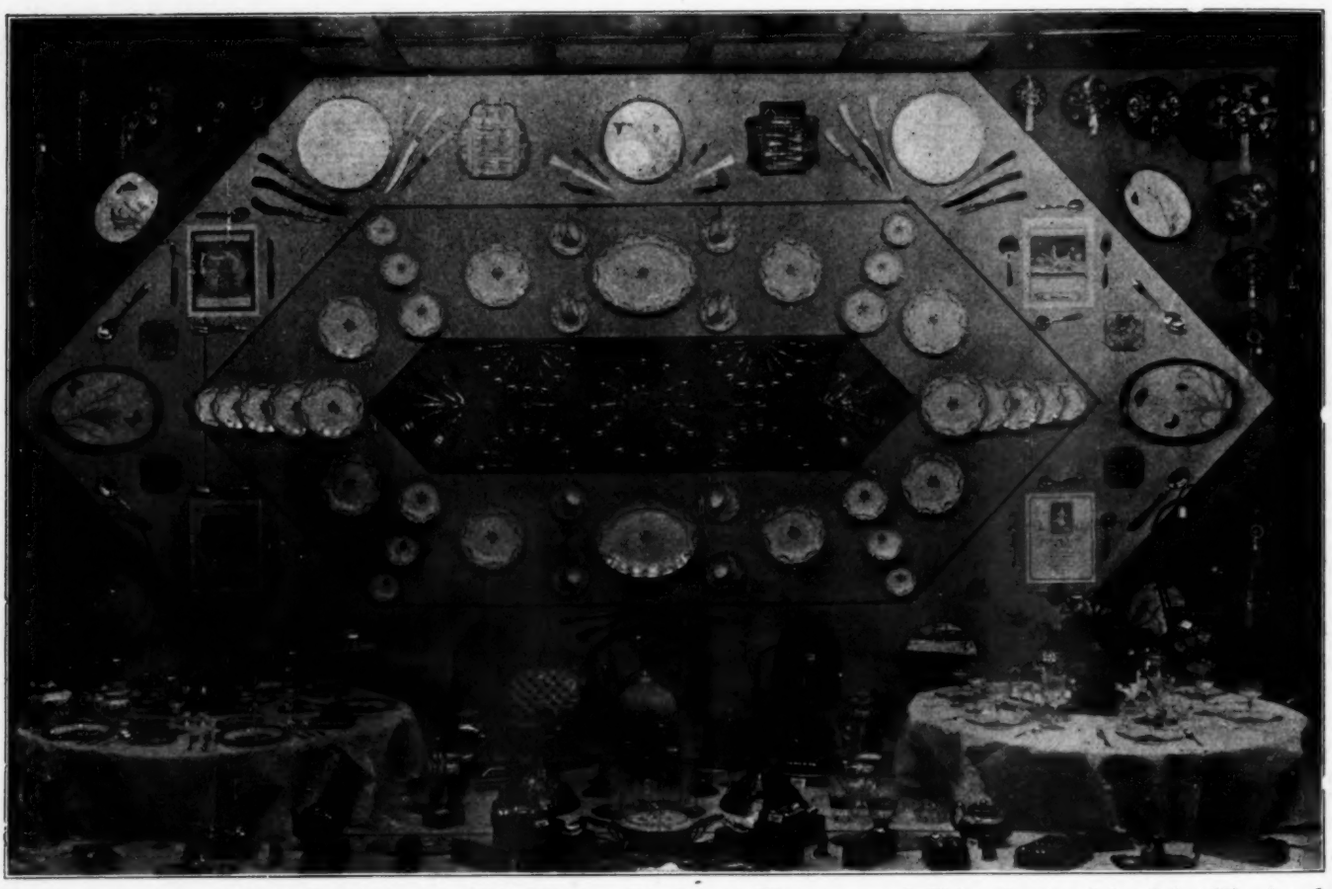
The description of the window as made by the firm is as follows:

"The center background of this display was salmon crepe paper. Next to this was lavender, then cream, with corners of salmon, all edged with black ribbon.

"Community silver was displayed in center on salmon. Next to this was Minton Flower design china on lavender (brass hooks were used to fasten china to the background). Around this on cream, fancy articles were displayed, and in the corners on salmon, were displayed many fancy colored baskets and trays.

"The floor was covered with lavender, asbestos table pads placed on boxes one foot high which served as tables. These were covered with linen tablecloths. One table was set for a dinner, displaying china and silverware; while the other was set for a luncheon, displaying glassware and silver. A large bouquet decorated each table. Fancy goods were artistically arranged on the floor.

"This display was responsible for a number of sales."



Is There Anything Left to Be Desired in This Window Display of Silverware and China Arranged by John Niemi and H. F. Westcott for I. E. Swift Company, Houghton, Michigan? If There Is, Let Us Know.

An ounce of performance is worth more than a pound of complaint.

Radio Has Come to Stay—Are You Taking Full Advantage of the Opportunity to Expand Your Business?

Farmers Can No Longer Afford to Hold Aloof from Radio and You Should Be Capitalizing on This Fact.

PERHAPS never in the history of the country since the days in "49," during the great westward movement known as the gold rush, has any one business project been so securely gripped in popular favor as the radio idea. The advent of the radio has completely revolutionized the life of the farmer and the dweller of the small town who rarely ever has a chance to get out of the town long enough to get a little culture. But radio has changed all this. The farmer is now able to know what the daily prices are; he is notified of the approaching storm hours in advance of its actual breaking; then, too, in the evening he is now entertained with a concert or two without leaving his home.

The small-town dweller is also placed in touch with the outside world.

You, Mr. Hardware Dealer! Are you taking full advantage of your opportunity to interest customers in your radio outfits? Many young men are apt to tell you that they can make a machine cheaper than you can sell it to them. Here you have a chance to prove quite the contrary to them. Show them that they are losing not only the use of the machine while it is in the making, but also later on when they must "fuss" around with it, testing it out, getting the home-made article to operate properly, they are losing time.

Despite the clamoring sometimes heard that radio is only a passing fad, radio has come to stay; it is a permanent fixture and an adjunct to our everyday life, and it is here to stay.

Many people may hesitate to buy just now because improvements are being constantly made and they fear that their machine will be antiquated before long. Suppose improvements are being made. Is it not better to have the enjoyment produced by the apparatus now in use than to be without it until such a time that the machine is perfected?

While we live, we must act. The three score and ten years allotted to each individual soon passes and unless we take full advantage of each and every minute, we will not have lived to the utmost, nor will we have progressed or developed as much as we could have in the time allotted us.

These same arguments can be applied to the selling of ranges or washing machines as well, but if you wish to work up a good radio business, you will have to prepare yourself to overcome the old argument that what was good enough for father is good enough for me.

Hardware Manufacturers' Association Issues Important Convention Notice.

The office of the Secretary of the American Hardware Manufacturers' Association has issued important announcements in connection with the Association convention to be held at Atlantic City, October 17, 18 and 19.

The convention program, it is announced, will include six industrial groups.

The primary purpose of dividing the membership into groups is to provide a practical way for members to exchange information, opinions and experiences.

At the October convention, the group meetings will be held on Thursday; separate meetings of the Transportation Group, the House-furnishing Group and the Mill Supplies Group will be held from ten to twelve a. m. The meetings of the Agricultural Group and the Sporting Goods Group will be held separately from 2:00 to 2:30 p. m. and the Builders' Hardware Group will hold their meeting from 3:45 to 5:15 p. m.

The Agricultural, Transportation and Builders' Hardware Groups meetings are scheduled at different hours so that those who are interested can attend all three meetings.

The chairmen of the groups are as follows: Agricultural group, W. A. Graham, Wallingford Manufacturing Company, New York, New York; Transportation group, J. E. Stone, The Stanley Works, New Britain, Connecticut; Builders' Hardware group, Murray Sargent, Sargent & Company, New Haven, Connecticut.

The Association also recommends that wherever possible the members take favorable action on two following suggestions: On behalf of the members of the Southern Hardware Jobbers' Association, John Donnan writes: "Will you kindly bring to the attention of your members the commendable practice of some manufacturers in printing an arrow against the items on their lists whose prices have been changed —the arrow to point down if price is lowered and point up if price is raised."

Herbert P. Sheets, Secretary-Treasurer of the National Retail Hardware Association, writes: "Here is a suggestion from one of our members which you may consider of sufficient importance to present to your members:

"This dealer recommends that manufacturers leave a blank space on their package labels of sufficient size for the retailer to mark his cost and selling prices.

"If you will notice the average label, it is designed solely to convey information as to kinds of goods, and when the package gets on the dealer's shelves he is forced to make his price notations over heavy printed matter.

"I am not presenting this as a serious problem. I can easily see the dealer's point of view, and it is likely that with most labels such a change can be made without additional expense."

In addition to the above several suggested topics for discussion at the convention have been printed below, and as it is the intention of the convention committee to present those topics which will be of greatest interest, the members are asked to check such topics as will prove most interesting, suggesting any others and signing their names:

Abuse of the Cash Discount.
Simplification.
Guarantee of Goods.
Parcel Post Shipments.
Repair and Repair Parts.
Present basic conditions in the Industry served by the Group.
Cancellations.
Returned Goods.
Direct or Drop Shipments.
Decimal System.
Freight Allowance.

Vierck Hardware Stages Unusually Attractive Window Display With Flowers and a Doll.

Places Hose, Lawn Mowers and Croquet Set in Foreground as Reminders of the Arrival of Spring and Its Needs.

THE attention value of a window display depends upon the intensity of feeling aroused and the absence of counter attractions. In what better way could a window display designer call attention to garden hose and lawn mowers than by the method employed as shown in the illustration? Here we have a window decorated by W. J. Vierck & Son, Rockford, Illinois. The doll itself would be sufficient to attract most people; then add to this the beautiful fountain and the yard, with the main items placed in the foreground, and the result is inevitable. Here the window designer has started out with the idea of suggesting the necessity of preparing for the approaching spring and summer with lawn mowers and garden hose. He has first made his appeal to the artistic sense of the observer and carried his message across in that manner. The following comment on the construction of the window was made by Mr. Vierck:

"First, we put one or more thicknesses of rubberoid roofing paper over the floor, on which we built another plank floor about 6 inches above the rubberoid covering. This was done to make a deeper receptacle for the water in the fountain measuring 10 inches,in addition to the 4 inches above the sod covering the planks.

"The water in this fountain was piped from the back end of the store up through the front window, with a regulating valve in the store to regulate the height of the water thrown out through the nozzle. This fountain was made in our own shop by one of our workmen, and could be made in any sheet metal shop for a sum not exceeding $20.00. A number of goldfish were placed in this fountain also.

"The picket fence was made by one of our clerks, and painted white. The jointed doll cost about $40.00, and about three feet high, and could be purchased from anyone handling this line of goods.

"The two trees represented apple trees in blossom. The trees themselves were cut along the roadside in the country and the blossoms attached to same.

"Tulips were planted in front of the picket fence while in season, and

Window Display Featuring Lawn Mowers, Garden Hose and Croquet Sets as Reminders of the Opening of Spring, Staged by W. J. Vierck & Son, 330 East State Street, Rockford, Illinois.

were later replaced with other plants, while morning glories were growing up the corner posts between the window, and a few geraniums placed at the base of same, all in bloom.

"This window was put in with the idea to move spring goods such as lawn mowers, hose and croquet sets, which also can be seen by looking at the picture."

Tried Low Price as Trade Inducer, But Found That Real Sales Did Not Materialize.

M. Richardson, a prominent hardware merchant in Tennessee, gave at the recent state convention the following as his experience in promoting paint sales:

"I want to tell you of a little experience that we had in our store that might be of interest or value to other dealers. That was along advertising. We handle paint. More than a year ago we put on a paint demonstration by giving away a can of varnish stain and varnish for ten cents. The idea was to get the people in the store. We were giving them fifty cents worth of stuff for ten cents. Of course, we had everybody register to get one. We had three hundred and fifty people come in the store, and it was a failure, because we discovered later that we were charging the people something and it was a sort of sales day proposition. People came in and paid their dime rather begrudgingly for fifty cents worth of stuff. We got nothing out of it, either advertising or sales. This year we advertised that we would absolutely sell no paint on a certain day but would give away $25.00 in premiums to everybody that came to our store and registered. Nearly eighteen hundred people registered at our store that day. A lot of them wanted to buy paint. We gave away $25.00 worth of rocking chairs and aluminum ware out of the store as premiums, but refused to sell them a dime's worth of paint. The following week we sold nearly four hundred gallons of paint. I am just giving you that for what it is worth, as to how you will fail and then hit the right thing."

Coming Conventions

The National Hardware Association and the American Hardware Manufacturers' Association, Atlantic City, New Jersey, October 16, 17, 18 and 19. F. D. Mitchell, 1819 Broadway, New York, is Secretary and Treasurer of the Manufacturers; T. J. Fernley, Secretary of Jobbers.

The twenty-fourth annual convention of the National Federation of Implement Dealers' Associations will be held at Hotel Sherman, Chicago, October 17, 18 and 19, 1923. H. J. Hodge, Abilene, Kansas, is Secretary.

Mountain States Hardware and Implement Association Convention, City Auditorium, Denver, Colorado, January, 1924. W. W. McAlister, Secretary-Treasurer, Boulder, Colorado.

Western Retail Implement and Hardware Association, Missouri Theater Building, Kansas City, January 15, 16, 17, 1924. H. J. Hodge, Secretary-Treasurer, Abilene, Kansas.

The West Virginia Retail Hardware Association, Convention and Exhibit, Huntington, West Virginia, January 15 to 18, 1924. James B. Carson, Secretary-Treasurer, 1001 Schwind Building, Dayton, Ohio.

Kentucky Hardware and Implement Association, Louisville, January 24-25, 1924. J. M. Stone, Secretary-Treasurer, 202 Republic Building, Louisville.

Indiana Retail Hardware Association, Inc., Convention and Exhibition, Cadle Tabernacle, January 29, 30, 31, February 1, 1924. G. F. Sheely, Secretary, Argos.

Wisconsin Retail Hardware Association Convention and Exhibition, Milwaukee Auditorium, February 6, 7, 8, 1924. George W. Kornely, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee. P. J. Jacobs, Secretary-Treasurer, Stevens Point.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 12, 13, 14, 1924. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

The Pennsylvania and Atlantic Seaboard Hardware Association, Incorporated, convention and exhibition at the Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14 and 15, 1924. Sharon E. Jones, Secretary-Treasurer, Wesley Building, Philadelphia.

New York Retail Hardware Association Convention and Exhibition, February 19, 20, 21, 22, 1924. Headquarters, McAlpin Hotel, and Exhibition at Seventy-First Regiment Armory. John B. Foley, Secretary, 412-413 City Bank Building, Syracuse.

The Ohio Hardware Association, Convention and Exhibit, Cincinnati, Ohio, February 19 to 22, 1924. James B. Carson, Secretary-Treasurer, 1001 Schwind Building, Dayton, Ohio.

A man is like a steel blade. The minute he loses his temper he ceases to be of value to anyone.

Retail Hardware Doings

California.

The American Avenue Hardware Company, Long Beach, has been capitalized for $250,000. There were 2,500 shares at $100 each.

A. E. Streeter & Company have sold their hardware business at Van Nuys, to Frank Colgrove and Sons.

The Live Hardware Company, South Pasadena, has purchased an acre of land with a frontage of more than 106 feet on Foothill boulevard. The ground is to be used for the erection of a building to be used as a branch store.

Georgia.

According to the Athens Georgia Herald, an involuntary petition in bankruptcy was filed in the local division of the United States Supreme Court at Columbus against the Bush Hardware Company.

Illinois.

The Drobisch Hardware store opened for business recently at South Oakland avenue, Decatur.

Otto R. Schultz, a member of the firm of Dowling-Schultz Hardware Company, has sold his interest in the business to his partner, Edward L. Dowling. The name of the firm will be changed to the Dowling Hardware Company.

Indiana.

The Lavengood Nash Hardware Store, Huntington, was completely destroyed by fire recently. The destroyed buildings were partially covered by insurance.

The A. C. Clinton Hardware Company, Rochester, has been purchased by Andrew Stehle and L. A. Shivery. This was said to have involved some $30,000.

Kansas.

W. E. Zimmerman, Olathe, has sold out his hardware business.

The Miller-Colby-Shaw Company has purchased the Elder Mercantile Company, which operated a hardware business at Ottawa. The entire stock of tinware, stoves and the tinshop on the upper floor have been taken over by the new company.

Missouri.

The Newman Hardware and Stove Company, Columbia, intends to make extensive improvements on the store building in the near future. A new display window will be installed and new fixtures for the store are also contemplated.

Montana.

T. A. Veblen, Big Timber, has purchased the stock of the Newton Hardware Company. Mr. Veblen is the head of the Veblen Hardware Company.

North Dakota.

G. L. McDonald has sold his hardware business to Gust Spencer, Litchville.

Oklahoma.

More than $15,000 in improvements will be put into the store of the Ford Hardware Company, Bristow, according to an announcement by Earl Ford. The entire building will be remodelled.

Wisconsin.

T. A. Jasperson Sons, Milltown, have disposed of their hardware store and stock. The purchasers are L. M. Hemnes and C. W. Barney.

Lorain Oven Heat Regulator Pushed Through Valparaiso Lighting Company.

The attention value of any object depends upon the intensity of feeling aroused, the absence of counter attractions, the contrast it forms with other objects, the ease with which it can be comprehended and the number of times it is seen.

Our attention is aroused by something which interests us. Our subconscious mind is always awake to the happenings around us, except when we are asleep, but in order to create active attention, we must hear or see something which is interesting to us, which gives us pleasure or pain.

In the accompanying reprinted advertisement we have an excellent appeal for attention. This ad is of the educational type and is highly instructive. Note the head "Lorain roasts a turkey to perfection." If anything would arouse interest this head certainly would; that is, it would attract the eye of a person, such as the housewife, the very person you wish to reach.

The arguments presented here in favor of the Lorain Oven Heat Regulator are convincing from start to finish. There is no attempt to present a large amount of reading matter to the prospect. The secret of the successful ad is its power to attract and the ad presented here does nothing more, giving the reader just enough salt on the subject, as it were, to make him want to investigate, which he will surely do after reading this appeal.

The manufacturers are certainly pushing their products through dealer advertising and the results are gratifying.

Lorain Cooks a Turkey to Perfection

No woman who owns a CLARK JEWEL RANGE—equipped with a LORAIN worries about her holiday dinner—or any other meal. The marvelous LORAIN HEAT REGULATOR makes all oven cooking successful.

There's nothing mysterious about LORAIN'S operations, but it's results are truly magical.

Lorain Oven Heat Regulator

One easy turn of the LORAIN red wheel gives you 44 measured and controlled oven heats for any kind of oven cooking or baking.

Clark Jewel Gas Ranges

We want you to hear the whole story of LORAIN and see it demonstrated at our store today. There's no obligation—will you come in?

Valparaiso Lighting Company

GAS SERVICE ELECTRIC

PHONE 16 **R. J. CORY, Manager**

Type of Advertisement Used by Valparaiso Lighting Company to Push Lorain Oven Heat Regulator.

Retail and Wholesale Distribution to Be Discussed at Northwestern University August 19.

Retail and wholesale distribution will be a subject for special discussion at the coming session at Northwestern University, Evanston, August 19 to September 1, of the National School for Commercial and Trade Executives. This course will be directed by Alvin E. Dodd, Manager of the Domestic Distribution Department of the Chamber of Commerce of the United States.

Commercial organization and trade association secretaries from virtually every state in the union will attend the school this year. Some of the more important fundamental courses to be given are psychology, economics, business and government, marketing and distribution, public speaking, journalism, salesmanship, industrial promotion and transportation.

One reason some dealers are slow about joining associations is that they get the mistaken idea that they are making a donation to something. They are not donating one cent—they are making an investment. They are buying stock in the biggest dividend-paying concern they can find.

The Attention Value of Your Advertisement Depends Upon the Contrast It Forms with Its Surroundings.

Be Sure that the Headline Forms This Contrast and Your Advertisement Will Stand Out in Bold Relief When Surrounded by Other Copy.

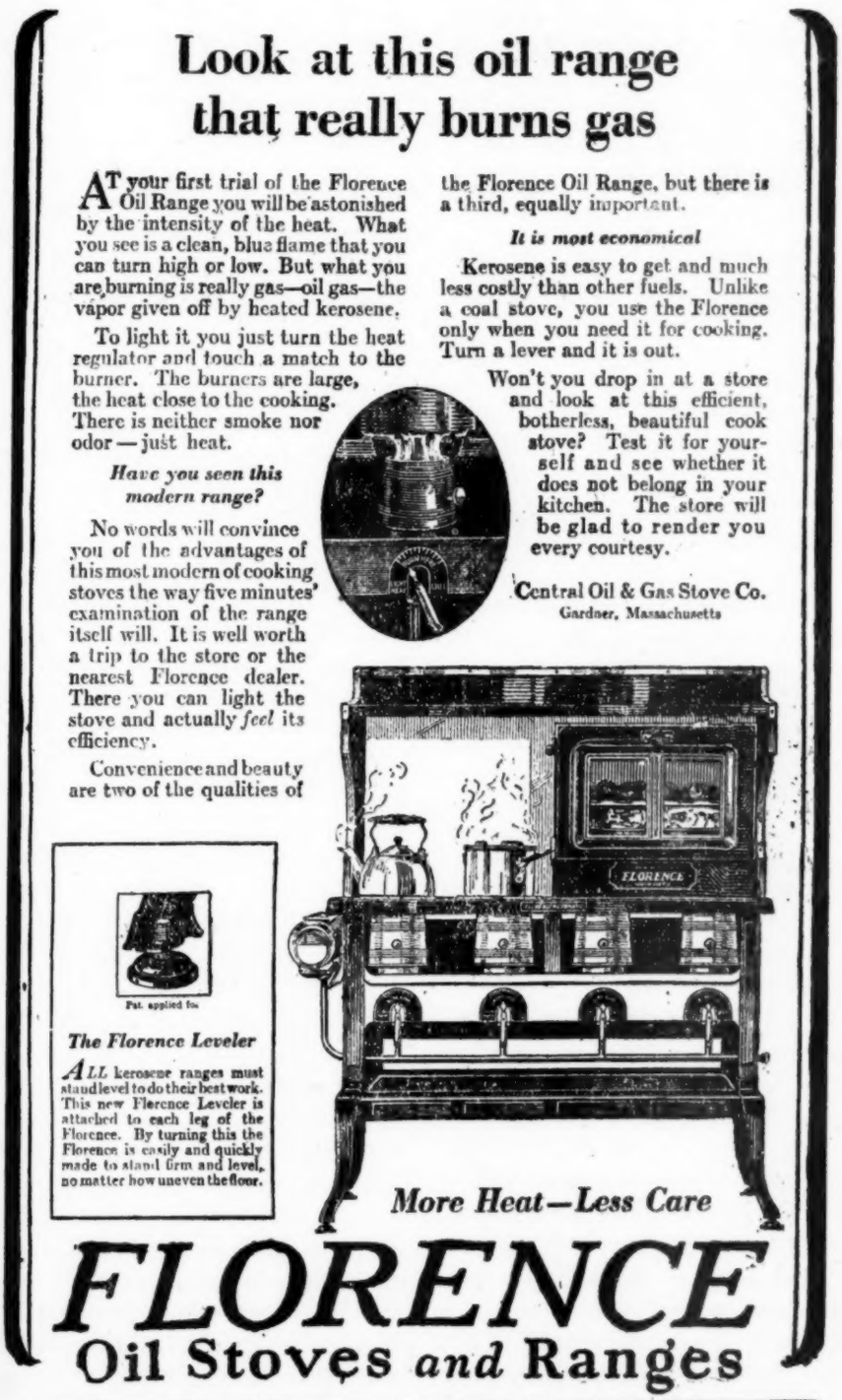
IT is generally conceded by successful advertisers that in comparatively small ads the copy writer should confine himself to one or two good arguments.

In the accompanying reprint from the Atlanta (Georgia) *Journal* the advertisement is well worked out; the headline is designed to catch the eye; the use of illustrations is good and the wording of the entire ad is excellent.

The copy writer has confined himself to a few outstanding features of the stove, illustrating these, and then devoting the remainder of the space to entreating the prospect to see the actual article in operation.

Where it was thought that the reading matter of the ad was too condensed, a sub-head was strategically inserted. In this way the amount of reading matter was broken up and the advertisement can be read with greater facility. The sub-heads can be read at a glance and intensify the reader's interest.

This ad is designed by the Central Oil & Gas Stove Company, Gardner, Massachusetts. It is one of the many ways in which the manufacturer helps the retail stove merchant to move his goods.


Look at this oil range that really burns gas
AT your first trial of the Florence Oil Range you will be astonished by the intensity of the heat. What you see is a clean, blue flame that you can turn high or low. But what you are burning is really gas—oil gas—the vapor given off by heated kerosene.
To light it you just turn the heat regulator and touch a match to the burner. The burners are large, the heat close to the cooking. There is neither smoke nor odor—just heat.
Have you seen this modern range?
No words will convince you of the advantages of this most modern of cooking stoves the way five minutes' examination of the range itself will. It is well worth a trip to the store or the nearest Florence dealer. There you can light the stove and actually feel its efficiency.
Convenience and beauty are two of the qualities of the Florence Oil Range, but there is a third, equally important.
It is most economical
Kerosene is easy to get and much less costly than other fuels. Unlike a coal stove, you use the Florence only when you need it for cooking. Turn a lever and it is out.
Won't you drop in at a store and look at this efficient, botherless, beautiful cook stove? Test it for yourself and see whether it does not belong in your kitchen. The store will be glad to render you every courtesy.
Central Oil & Gas Stove Co.
Gardner, Massachusetts
Pat. applied for
The Florence Leveler
ALL kerosene ranges must stand level to do their best work. This new Florence Leveler is attached to each leg of the Florence. By turning this the Florence is easily and quickly made to stand firm and level, no matter how uneven the floor.
FLORENCE
More Heat—Less Care
FLORENCE
Oil Stoves and Ranges

Select the Kind of Advertising That Suits Your Business.

Not all merchants have the same experience. Not all of them work under similar conditions. Some get very good results from their local newspaper advertising. Some get poor results. Almost all get best results from circulars and letters mailed direct to the trade. I know merchants who do the largest share of their advertising by means of a mimeograph duplicating machine. They have circulars prepared on it going out every week. The results are usually remarkable. Each case has to be studied separately. Some experiments have to be tried. In the end the best way will be found. —*C. E. Lawrence.*

Perhaps one reason you don't get more out of your trade paper is that you don't read it. Perhaps another reason is that you don't think when you do read.

Products Steadily Going Into Consumption; Consumers' Demand Good; Freight Movements Continue Large.

July Estimate Shows Gain in Leading Grains; Some Non-Ferrous Metal Prices Go Up, While Others Decline—Lead and Zinc Strong.

THE farmers are buying merchandise to meet current needs, particularly where prices are to their liking. This is the experience of the big Chicago mail order houses.

July sales of Sears, Roebuck & Company totaled $14,960,939, an increase of 22.18 per cent over July, 1922. Furthermore, last month's business was somewhat larger than in June, although usually there is a seasonal recession in midsummer.

Sales for the seven months ended July 31 totaled $121,738,196, a gain of 28.49 per cent over the corresponding period last year.

July sales of Montgomery Ward & Company were $7,491,908, an increase of 46.61 per cent over July, 1922, and sales for the seven months aggregated $71,928,928, a gain of 53.33 per cent over last year's period.

Probably the most encouraging bit of news was the evidence of continued heavy purchasing of goods reflected in data on the railroad freight movement.

Car loadings for the week ended July 21 broke all previous records with a total of 1,028,927 cars. This marks an increase of 7,157 cars over the previous high record in the last week of July. It also is a gain of 9,260 cars over the preceding week.

The current increase in freight movement, which consisted chiefly of merchandise and miscellaneous freight, was hailed as evidence that the July slump in trade has passed and that deliveries for autumn are beginning.

Copper.

The buying of copper by domestic consumers has been light throughout the week.

In the outside market business is light and the tone of the market is easy.

Electrolytic is quotable at 14.50 to 14.60 cents f.o.b. refinery for prompt August and September shipment.

Very little interest is taken in later positions.

Lake copper is dull at 14.87½ cents delivered for early shipment and casting copper is quiet at 14.25 cents f.o.b. refinery.

Producers' prices of Electrolytic for prompt, August, September, October delivered are 14.62½ cents.

Lead.

The condition of the lead market as a whole is much quieter than it was a week ago.

In the western market lead is more freely offered for early shipment, and at slight concessions in price but the East St. Louis position is still above the "official" New York price of 6.50 cents—the disparity being due to the fact that producers have little metal to offer, and the holders are evidently anticipating a further rise.

Manufacturers of lead products report a general improvement in nearly all lines in the volume of orders, but no remarkable activity. A good demand is reported for lead for building purposes, more especially in the West.

St. Louis quotations are: prompt, 6.65 to 6.70 cents; August, 6.65 to 6.70 cents; September, 6.65 to 6.70 cents.

Tin.

The buyers of tin are showing very little interest, while the price is ¼ cent lower.

Partly as a result of lower exchange, but more especially on the account of the dullness in demand, the prices in the New York market have declined ¼ cent to the basis of 38.62½ cents for Straits, 38.37½ cents for Banka and 38.12½ cents for 99 per cent for prompt deliveries. Futures are offered at ⅛ cent below these prices and it is not unlikely that bids of ¼ cent less would be accepted.

Zinc.

The demand for zinc is at present light, consumers buying only in accordance with their needs. There are but few consuming orders or inquiries reported in the market.

In some directions a more receptive disposition is manifested by sellers, but there have been no bids to test the market thoroughly, and nominally there is little quotable change.

East St. Louis quotes as follows: Prompt, 6.27½ to 6.32½ cents; August, 6.27½ to 6.32½ cents; September, 6.30 to 6.35 cents; October, 6.32½ to 6.37½ cents.

Tin Plate.

Although the end of July is now reached and the close of the canning season in most of the crops is only a few weeks distant, there is nothing seen to encourage suspicions recently entertained in some quarters that consumers were overestimating their requirements, as they sometimes do.

There is great pressure of can-

Regarding Business Outlook

HARVARD Economic Service in weekly letter dated July 28, says:

"The absence of cancelations and the readiness with which shipments are received by buyers indicate that goods are steadily going into consumption.

"The sales of department stores and mail-order houses have been larger during last six months than in the same months of 1922.

"With labor fully employed at high wages, consumers' demand should remain good; and this in turn would necessitate a new buying movement on the part of distributors."

ners upon can makers and of can makers upon tin plate mills, for heavier deliveries.

There is no news to the effect that any of the canning crops will run below expectations, and in some lines it seems the crops will be still heavier.

There may be some sales at above $5.50, but if so, the extra price can be attributed to really retail lots being involved.

The market is simply quotable firm and inactive at $5.50.

The leading interest and the independents are operating at much the same rate, production being at say 75 to 80 per cent of full capacity. This is on the tonnage basis.

The number of turns worked is a slightly larger percentage than the tonnage output, as in the summer, mills do not produce their full average output per mill per turn.

Solder.

Chicago warehouse prices on solder are as follows: Warranted 50-50, $24.50; Commercial, 45-55, $22.75, and Plumbers', $21.00.

Sheets.

Sheet requirements are running quite heavy as measured by deliveries on old orders and specifications, and there are new specifications coming in on contracts at a fair rate.

Measured by these two movements, the demand for sheets is heavy. Measured by the strictly new buying the demand is decidedly light.

There is little business being done that is represented in actual open market sales.

Naturally consumers are covered by previous engagements and as their requirements are not running beyond expectations they have no occasion to make fresh purchases. The buying that is being done is by occasional and small buyers.

It is a disputable point how the market in black sheets should be quoted, whether firm at 3.85 cents, fairly steady at 3.85 cents, with some cutting, or simply 3.75 cents to 3.85 cents.

It will be admitted in most quarters that the question whether a market is weak or has declined is to be determined by the proportion of the business that is done at concessions, but as to what this should be proportioned to there is difference of opinion.

There is not even a rumor, of any standing, that either blue annealed or galvanized sheets are being cut at all. The market is firm on blue annealed at 3.00 cents and galvanized at 5.00 cents and steady on black to 3.85 cents.

Old Metals.

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $21.00 to $21.50; old iron axles, $27.00 to $27.50; steel springs, $22.00 to $22.50; No. 1 wrought iron, $15.50 to $16.00; No. 1 cast, $18.50 to $19.00, all per net tons. Prices for non-ferrous metals are quoted as follows, per pounds: Light copper, 9½ cents; light brass, 5 cents; lead, 4¼ cents; zinc, 3½ cents; and cast aluminum, 15 cents.

Interest Resumed in Pig Iron Market for Third and Fourth Quarter Delivery; Prices Are Still Weak.

Activity Increasing in Foundry Iron at Pittsburgh—Improvement Noted at Chicago—Southern Sales Made at $24.

THE pick-up in pig iron buying has spread to all districts and considerable tonnage has been closed for third and fourth quarters.

Buffalo reports July sales in that district totaled 100,000 to 150,000 tons. Some large buyers are inquiring for a round tonnage. Prices remain erratic and soft.

One southern producer is selling at $24. Basic has been offered under $25, valley basis.

Some further large structural projects are in sight though new awards are not heavy. Preliminary estimates by the engineers place the steel requirements of the new Cleveland Union station at 75,000 tons. Bids for excavation now are being taken. A 10,000-ton bridge at Perth Amboy, New Jersey, is up. For the Philadelphia-Camden bridge 12,000 tons of alloy and 8,000 tons of carbon steel will be placed soon. Awards this week total 8,650 tons with inquiries over 40,000 tons.

Oil tank demand again has brought out some large orders this week. The leading contract was by the Sinclair interest which closed for sixty tanks requiring 18,000 tons of steel.

Municipalities are coming into the market for large lots of cast iron pipe. New York this month will buy 13,000 tons and up-state cities 10,000 tons. Los Angeles is taking bids on 8,000 to 10,000 tons and Cleveland on 7,000 tons.

Pig iron inquiry from Chicago foundries shows further improvement.

Sales are being made in steady volume at $27 to $27.50, Chicago. Two or three merchant furnaces in this district however, are expected to go out within 10 days.

A Wisconsin melter wants 1,000 tons of malleable. Several Illinois foundries are asking for a 200 to 500-ton lot. A Michigan foundry bought 300 tons of southern iron at $24, base, or $30.61, delivered. A report that a malleable casting interest took 2,500 tons of malleable for August is denied.

An inquiry for this amount recently has been pending. Charcoal iron is $32.15, delivered. Silvery iron of 8 per cent is $34.50, furnace, or $39.29, delivered in Chicago. Foundry stocks of iron are low, and demand for castings is strong. More buying is expected.

Rogers, Brown & Company says: "Prices are becoming stable and there is a growing sentiment that bottom has been hit.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry	27.50 to 28.00
Southern Fdy. No. 2	31.01 to 33.01
Lake Sup. Charcoal	36 65
Malleable	27.50 to 28.00

FIRST QUALITY BRIGHT TIN PLATES.

			Per Box
IC	14x20	112 sheets	$12 45
IX	14x20		14 65
IXX	14x20	56 sheets	17 57
IXXX	14x20		15 12
IXXXX	14x20		18 65
IC	20x28	112 sheets	27 50
IX	20x28		29 85
IXX	20x28	56 sheets	16 15
IXXX	20x28		17 20
IXXXX	20x28		18 25

TERNE PLATES.

				Per Box
IC	20x28,	40-lb.	112 sheets	$25 60
IX	20x28,	40-lb.	" "	28 50
IC	20x28,	30-lb.	" "	21 80
IX	20x28,	30-lb.	" "	24 70
IC	20x28,	25-lb.	" "	20 80
IX	20x28,	25-lb.	" "	23 70
IC	20x28,	20-lb.	" "	18 30
IV	20x28,	20-lb.	" "	21 15
IC	20x28,	15-lb.	" "	17 05
IC	20x28,	12-lb.	" "	15 75
IC	20x28,	8-lb.	" "	14 05

COKE PLATES.

Cokes, 80 lbs., base, 20x28.	$14 05
Cokes, 90 lbs., base, 20x28.	14 30
Cokes, 100 lbs., base, 20x28.	14 65
Cokes, 107 lbs., base, IC 20x28	15 10
Cokes, 135 lbs. base, IX 20x28	17 15
Cokes, 155 lbs. base, 56 sheets	9 30
Cokes, 175 lbs. base, 56 sheets	10 10
Cokes, 195 lbs. base, 56 sheets	10 95

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $4 00

ONE PASS COLD ROLLED BLACK.

No. 18-20.....per 100 lbs.	$5 00
No. 22-24.....per 100 lbs.	5 05
No. 26.....per 100 lbs.	5 10
No. 27.....per 100 lbs.	5 15
No. 28.....per 100 lbs.	5 20
No. 29.....per 100 lbs.	5 30

GALVANIZED.

No. 16.....per 100 lbs.	$5 60
No. 18-20.....per 100 lbs.	5 75
No. 22-24.....per 100 lbs.	5 90
No. 26.....per 100 lbs.	6 05
No. 27.....per 100 lbs.	6 20
No. 28.....per 100 lbs.	6 35
No. 30.....per 100 lbs.	6 85

BAR SOLDER.

Warranted.
50-50 .....per 100 lbs. 24 50

Commercial.
45-55 .....per 100 lbs. 22 75
Plumbers .....per 100 lbs. 21 00

ZINC.

In Slabs..... 6 18

SHEET ZINC.

Cask lots, stock, 100 lbs...	11 00
Less than cask lots, 100 lbs.	11 50

BRASS.

Sheets, Chicago base	23½c
Mill Base	22¾c
Tubing, brazed, base	28½c
Wire, base	19¼c

COPPER.

Sheets, Chicago base	23¾c
Mill Base	22¾c
Tubing, seamless, base	27c
Wire, No. 9 & 10 B. & S. Ga.	22¼c
Wire, No. 11 B. & S. Ga.	22c
American Pig	6 50
Bar	7 50

Sheet.
Full Coils.....per 100 lbs. 10 25
Cut coils.....per 100 lbs. 11 25

TIN.

Pig Tin .....per 100 lbs.	39 25
Bar Tin .....per 100 lbs.	40 25

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's .....Net
White's .....Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%

Winchester.
Smokeless Repeater Grade .....20 & 4%
Smokeless Leader Grade .....20 & 4%
Black Powder .....20 & 4%

U. M. C.
Nitro Club .....20 & 4%
Arrow .....20 & 4%
New Club .....20 & 4%

Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16.....6c per lb.
Rollboard .....6¼c per lb.
Millboard 3/32 to ⅛.....6c per lb.
Corrugated Paper (150 sq. ft. to roll)....$6.00 per roll

AUGERS.

Boring Machine.....40&10%

Hollow.
Stearns, No. 4, doz.....$11 50

Post Hole.
Iwan's Post Hole and Well 35%
Vaughan's, 4 to 9 in.....$15 60

AXES.

First Quality, Single Bitted (unhandled, 3 to 4 lb., per doz.....$14 00
Good Quality, Single Bitted, same weight, per doz. 13 00

BARS, CROW.

Steel, 4 ft., 10 lb.	$ 80
Steel, 5 ft., 18 lb.	1 40
Pinch bars, 5½ ft., 24 lb.	1 60

BARS, WRECKING.

V. & B. No. 12	$0 34
V. & B. No. 24	0 43
V. & B. No. 324	0 57
V. & B. No. 30	0 48
V. & B. No. 330	0 63

BITS.

All Vaughan and Bushnell.

Screw Driver, No. 30, each	$ 27
Screw Driver, No. 1, each	16
Reamer, No. 80, each	41
Reamer, No. 100 each	41
Countersink, No. 13, each	20
Countersink, Nos. 14-15 each	27

BLADES, SAW.

Wood.
Atkins 30-in.

Nos.	6	40	26
	$8 90	$9 45	$5 40

BLOCKS.

Wooden 45%
Patent 45%

BLOW TORCHES (See Firepots). BOARDS.

Stove.			Per Doz.
26x26,	wood	lined	$14 45
28x28,	"	"	16 95
30x30,	"	"	19 00
26x26,	paper	lined	8 15
28x28,	"	"	9 10
30x30,	"	"	10 80

Wash.

No. 760, Banner Globe (single)	per doz.	$5 25
No. 652, Banner Globe (single)	per doz.	6 75
No. 801, Brass King,	per doz.	8 25
No. 860, Single—Plain Pump		6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅜x6 and sizes smaller and shorter 45-5%
Carriage sizes, larger and smaller and shorter....40-5%
Machine, ⅜x4 and sizes smaller and shorter.....50%
Machine, sizes larger and longer than ⅜x4.....40-10%
Stove 70-5%

BRACES, RATCHET.

V. & B. No. 444	8 in.	$4 54
V. & B. No. 222	8 in.	3 89
V. & B. No. 111	8 in.	3 55
V. & B. No. 11	8 in.	3 02

BURRS.

Copper Burrs only.....30%

BUTTS.

Steel, antique copper or dull brass finish—case lots—3½x3½—per dozen pairs $3 48
4x4 ..... " " " 4 74
Heavy Bevel steel inside sets, case lots—.....per dozen sets 3 00
Steel bit keyed front door sets, each 2 00
Wrought brass bit keyed front door sets, each.... 4 00
Cylinder front door sets, each 3 50

CATCHERS, GRASS.

Wire frame, adjustable bottom, white duck, for 12" to 16" mowers, dozen.....$3 00
Same kind for 18" to 20". 10 50

CEMENT, FURNACE.

American Seal, 5 lb. cans, net		$ 45
" " 10 lb. cans,	"	90
" " 25 lb. cans,	"	2 00
Asbestos, 5 lb. cans	"	45
Pecora.....per 100 lbs.		7 51

CHAINS.

Proof Coil, ⅜" 100 lbs.	$ 9 75
Amercain Coil 40-10%	
Electric Cow Welded Ties No. 00, 4½, per doz.	3 00

Sher. Steel Safety Chain.

500-ft. coil, per ft.	.01½
100 to 500 ft., per ft.	.02
Less than 100 ft., per ft.	.02½

Iron Jack Chain.
Box (12 yds.)..... .45

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent. 30%
Iwan's Iron Mountain only..35%
Standard .....30 to 40%

CHISELS.

Cold.

V. & B. No. 25, ¼ in., each	$0 26
V. & B. No. 25, ⅜ in., each	41

Diamond Point.

V. & B. No. 55, ¼ in.	0 31
V. & B. No. 55, ½ in.	0 48

Firmer Bevelled Round Nose.

V. & B. No. 65, ¼ in.	0 29
V. & B. No. 65, ½ in.	0 40

Socket Firmer. Cape.

V. & B. No. 50, ⅜ in.	0 31
V. & B. No. 50, ¾ in.	0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers .....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CLAMPS.

Adjustable.
Martin's 30%
No. 63, Screw.....20%
No. 100, Door (Stearns) doz. $22 00

Carpenters'.
Steel Bar..List price plus 20%

Carriage Makers'.
2½-inch.....per doz. $ 7 00
5 - " ..... " 14 00
8 - " ..... " 25 00
12 - " ..... " 42 00

Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20

CLIPS.

Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 25

COPPERS—Soldering. Pointed Roofing.

3	lb. and heavier....per	lb.	40c
2½	lb.....	"	45c
2	lb.....	"	45c
1½	lb.....	"	55c
1	lb.....	"	60c

CORD.

No. 7	Std.	per doz.	banks.	$10 80
No. 8	"	"	"	12 50

CORNICE BRAKES.

Chicago Steel Bending.
Nos. 1 to 6 B.....10%

COUPLINGS, HOSE.

Brass.....per doz. $2 25

CUT-OFFS

Kuehn's Korrekt Kutoffs:
Galv., plain, round or cor. rd. Standard gauge 40%
26 gauge 10%

DAMPERS.

"Yankee" Hot Air.

7	inch, each	20c,	doz.	$1 75
8	" "	25c,	"	2 40
9	" "	30c,	"	2 75
10	" "	32c,	"	3 00

Smoke Pipe.

7	inch, each	$ 35
8	" "	40
9	" "	50
10	" "	60
12	" "	90

Reversible Check.

8	inch, each	$1 50
9	" "	1 70

DIGGERS.

Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. $14 00
7-ft. Handle...per doz. 36 00
Iwan's Hercules pattern, per doz. 14 00

DRILLS.

V. & B. Star, 12-inch Length.

¼, 5/16 and ⅜, each	$ 35
⅜, each	36
½, each	54
1¼, each	81

V. & B. Star, 18-inch Length.

5/16 and ⅜, each	$ 33
⅜, each	45
½, each	69
1¼, each	1 05

EAVES TROUGH.

Milcor .....
Galv. Crimpedge, crated...70-5%

ELBOWS—Conductor Pipe.

Milcor .....
Galv., plain or corrugated, round flat.
Crimp, Std. gauge.....60%
26 Gauge Std. gauge.....40%
24 Gauge Std. gauge.....10%

Square Corrugated.
Milcor .....
Standard gauge 45%
26 gauge 30%

Portico Elbows.
Standard Gauge Conducter Pipe, plain or corrugated.
Not nested .....70 & 5%
Nested solid .....70 & 5%

ELBOWS—Stove Pipe.

1-piece Corrugated. Uniform.	Doz.
5-inch	$1 45
6-inch	1 60
7-inch	2 10
Special Corrugated.	Doz.
6-inch	$1 45
7-inch	1 75

Terne Plate Specialists

Since the beginning of the industry in this country.

Write for samples.

Our Brands

shown here ranging from 40 to 8 pound have proven their unusual lasting qualities by years of actual service.

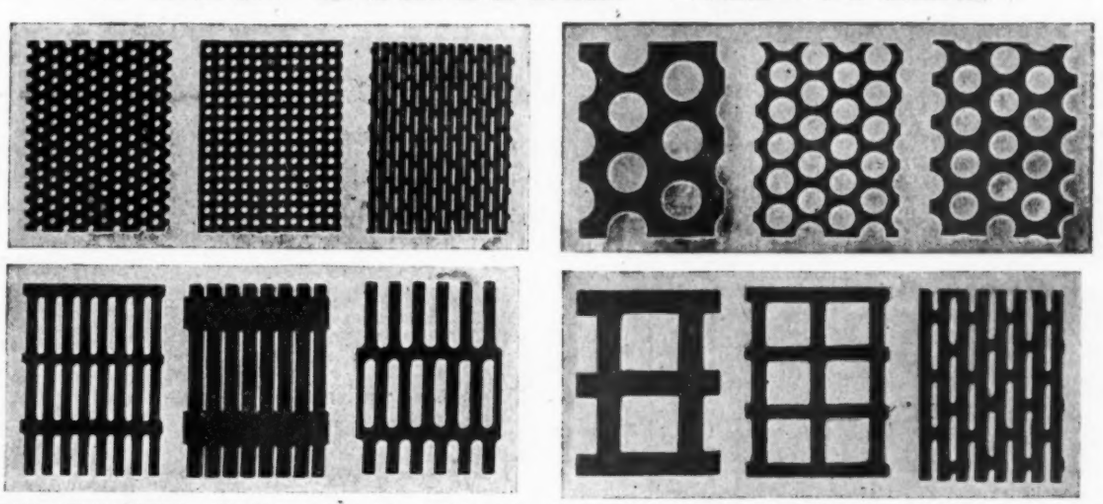
A LARGE stock of all brands always carried in stock for immediate shipment. Also manufacturers of "Osborn Quality" Gutter and Conductor, 28 gauge being our standard

Let us quote on your requirements.

THE J. M. & L. A. OSBORN CO., CLEVELAND

Sheet Metal Workers' and Furnacemen's Supplies

PERFORATED METALS



PERFORATED STEEL—COPPER—BRASS—BRONZE—ALUMINUM—ZINC—TIN PLATE and all other metals
For Screening and Sizing STONE—GRAVEL—SAND—COAL—all minerals—GRAIN and anything to be screened.
For DRYING FLOORS AND DECKS—VENTILATORS—DRAINS—ETC.
GRILLES—REGISTER FACES and ORNAMENTAL SCREENS.

Perforated Tin and Brass always in stock.

THE HARRINGTON & KING PERFORATING CO.

610 NORTH UNION AVE., CHICAGO, ILL., U. S. A.
NEW YORK OFFICE, 114 LIBERTY ST.

Uniform, Collar Adjustable.

	Doz.
5-inch	$2 00
6-inch	2 10
7-inch	2 60

WOOD FACES—50% off list.

FENCE.

Field Fence	60½
Lawn "	53%

FILES AND RASPS.

Heller's (American)	65-5%
American	65-5%
Arcade	60 & 10%
Black Diamond	50-5%
Eagle	60-10%
Great Western	60 & 10%
Kearney & Foot	60 & 10%
McClellan	60 & 10%
Nicholson	50-14%
Simonds	60%

FIRE POTS.

Ashton Mfg. Co.
Complete line Firepots and Torches...52%

Otto Bernz Co.

No. 1 Furn. Gasolene with large shield, 1 gal.	$ 6 75
No. B Furn. Kerosene, 1 gal.	15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals.	47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt.	7 92
No. 83 Torch, Gasolene, 1 quart	5 40
No. 86 Torch, Gasolene, 1 pt.	4 05

Clayton & Lambert's.
East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 52%
West of above boundary line..48%

Geo. W. Diener Mfg. Co.

	Ea.
No. 02 Gasolene Torch, 1 qt.	$ 5 55
No. 0250, Kerosene or Gasolene Torch, 1 qt.	7 50
No. 10 Tinners' Furn. Square tank, 1 gal.	12 60
No. 15 Tinners' Furn. Round tank, 1 gal.	12 00
No. 21 Gas Soldering Furnace	3 60
No. 110 Automatic Gas Soldering Furnace	10 50

Double Blast Mfg. Co.
Gasolene, Nos. 25 and 35...60%

Quick Meal Stove Co.
Vesuvius, F.O.B. St. Louis 30% (Extra Disct. for large quantities)

Chas. A. Hones, Inc.

Buzzer No. 1	$ 9 00
" " 2	12 00
" " 22	13 50
" " 42	15 00
" " 43	19 00

FREEZERS—ICE CREAM.

Peerless and Alaska

1 quart	$2 95
2 quart	3 45
3 quart	4 10

White Mountain

½ quart	$3 50
1 quart	4 90
2 quart	5 70

GALVANIZED WARE.

Pails (Competition), 8-qt.	$2 00
10-qt.	2 25
12-qt.	2 65
14-qt.	3 00
Wash tubs, No. 1	7 00
No. 2	7 25
No. 3	8 00

GARAGE DOOR HARDWARE.
Stanley ....All net

GAUGES.
Marking, Mortise, etc. ....Nets

Wire.
Disston's 25%

GIMLETS.
Discount ....65% and 10%

GLASS.
Single Strength, A and B, all sizes ....82 & 85%
Double Strength, A, all sizes 84%

GREASE, AXLE.

Frazers'

1-lb. tins, 36 to case, per case	$ 4 70
3-lb. tins, 24 to case, per case	7 80
5-lb. tins, 12 to case, per case	7 20
10-lb. tins, per dozen	10 40
15-lb. tins, per dozen	13 80
25-lb. tins, per dozen	19 80

HAMMERS, HANDLED.

All V. and B.	Each, net
Blacksmiths' Hand, No. 0, 26-oz.	$1 00
Engineers' No. 1, 26-oz.	1 00
Farrier's, No. 7, 7-oz.	93
Machinists', No. 1, 7-oz.	78
Nail. Vanadium, No. 41, 20-oz. each	1 45
Vanadium, No. 41½, 16-oz., each	1 45
V. & B., No. 11½, 16-oz. each	1 04
Garden City, No. 111½, 16-oz., each	87
Tinner's Riveting, No. 1, 8-oz., each	82
Shoe, Steel, No. 1, 18-oz., each	65
Tack. Magnetic. No. 5, 4-oz., each	72

HAMMERS, HEAVY.

Farrier's	20%
Mason's. Single and Double Face	50%

HANDLES.

Axe. Hickory, No. 1 ....per doz.	4 00
Hickory, No. 2 .... "	3 00
1st quality, second growth	6 00
Special white, 2nd growth	5 00
Chisel. Hickory, Tanged, Firmer Assorted ....per doz.	55c
Hickory, Socket, Firmer, Assorted ....per doz.	70c
File ....per doz.	$1 20
Hammer and Hatchet. No. 1 per doz.	$0 90
Second growth hickory, per doz.	1 50
Soldering. Per doz.	$2 40

HANGERS.

Conductor Pipe. Milcor Perfection Wire	25%
Eaves Trough. Steel hangers	30%
Triple Twist wire	10%
Milcor Eclipse Wire	20%
Milcor Triplex Wire	15%
Milcor Milwaukee Extension	15%
Milcor Steel (galv. after forming) List plus	12½ %
Milcor Selflock E. T. Wire, List plus	40%

HASPS.
Hinge, Wrought, with staples, Net

HATCHETS.

V. and B. Supersteel.	Each
Broad, No. 1, 24-oz.	$1 43
Half, No. 1, 15-oz.	1 25
Half, No. 3, 27-oz.	1 37
Claw, No. 1, 19-oz.	1 31
Flooring, No. 1, 20-oz.	1 43
Shingling, No. 1, 17-oz.	1 20
Lathing, No. 1, 14-oz.	1 20
Lathing, No. 2, 17-oz.	1 25
Vanadium Steel. Half, No. 62, 22-oz.	$1 82
Underhill Pattern Lathing, 9 row, 19-oz.	2 29

HINGES.

Heavy Strap, in Bundles. 4 inch, dozen prs.	$1 12
5 " " "	1 57
6 " " "	1 93
8 " " "	3 21
Extra Heavy T in Bundles. 4 inch, dozen prs.	$1 74
5 " " "	1 85
6 " " "	2 31
8 " " "	3 97

HOES.
Garden ....Net

HOOKS.

Box. V. and B. No. 9, each	$0 26
Conductor. Milcor	
"Direct Drive" Wrought Iron for wood or brick	15%
Cotton. V. and B. No. 8, each	24
Hay. V. and B. No. 1, each	26
Bar Meat. V. and B. No. 26, ¾", each	09
V. and B. No. 28, ½", each	16
Screw Meat. V. and B. No. 2, per gro.	6 50
Butchers' "S." V. and B. No. 6, each	08
V. and B. No. 8, each	11

HOSE.

	Per. Ft.
¾-in. 2 ply molded	9½c to 12¾c
¾-in. cord	8½c to 10c
¾-in. wrapped	13½c

HUMIDIFIERS.

"Front-Rank," Automatic. In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

IRONS.

Sad. Genuine Mrs. Potts, nickel plated, per set	$1 55
Asbestos No. 70, per set.	2 10
Asbestos No. 100, per set.	2 30
E. C. Stearns'. No. OA Corner, doz. sets	$2 50
No. OB " " "	2 75

KNIVES.

Butcher. Beechwood Handles, 6-inch blade	25%
Beechwood Handles, 7-inch blade	25%
Beechwood Handles, 8-inch blade	25%
Cooper's Hoop.	25%
Drawing. Standard	25%
Adjustable	25%
Barton's Carpenters'	25%
Hay. Iwan's Solid Socket	25%
Heath's	25%
Iwan's Sickle Edge	25%
Iwan's Imp'd Serrated	25%
Hedge. Challenge	25%
Disston's No. 1	25%
Putty. Common	25%
Lander's	25%
Scraping. Beech Handles	25%
Lander's	25%

KNOBS.

Door. Mineral ....per doz.	$2 00
Porcelain .... "	2 00
Jet .... "	2 00

LADDERS.

Step. Common, per ft.	28c
Common, with Shelf, add 10c	
IXL	34c
Challenge, 6 to 9 ft.	55c
10 to 16 ft.	60c
Kant-Break, per lineal ft.	75c

LANTERNS.

	Per doz.
Monarch tin, hot blast	$ 8 25
Dietz No. 2, cold blast	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LAWN MOWERS.

12-inch	$5 20
16-inch	5 85
Ball Bearing. 4 blade, adjustable bearing. 14"	$7 50
16"	7 80

LEATHER BELTING.

From No. 1 Oak Tanned Butts. Extra heavy, 18-oz.	35%
Heavy, 16-oz.	40%
Medium, 14½-oz.	40%
Light, 13-oz.	50%

LEATHER LACING.
Cut, strictly No. 1 ....45%

LEVELS.

Disston, No. 28 Asst.	$22 05
" No. 18, 20 in., each	1 83
" No. 22, 24 in., each	2 40
" Shafting, 6 in.	19 80
" " 6 in. gr. glass	24 20
" No. 1 Asst.	5 75
" No. 2 Asst.	12 40
" 24-26 in., each	1 02
" 28-30 in., each	1 00

LIFTERS.

Stove Cover. Coppered ....per gro.	$6 00
Alaska .... "	4 75

LOCKS.

Barn Door. No. 60 Stearn's ..per doz.	$11 00
No. 80 " "	20 00

MALLETS.

Carpenters'. Fibre Head No. 2, per doz.	$12 00
" No. 3, "	15 50
" No. 3½, "	20 50
Round Hickory ....per doz.	$3 00— 5 00
Tinners'. Hickory ....per doz.	$2 25

MATS.

Door. National Rigid ....5 & 10 & 5%	
Acme Steel Flexible	50%

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets	30%
Milcor	
Galv. one piece stamped	40%

MOPS.

Cotton, Star (Cut Ends).				
Pounds	12'	15'	18'	24'-3-oz.
Per doz.	$4 00	4 25	5 50	7 00
Enterprise 16¾%				
Parker ....50 & 5%				

NAILS.

Cut Steel	$4 70
Cut Iron	4 70
Wire. Common	3 80
Cement Coated. Small Lots	2 80
Horseshoe. Ausable ....55 & 5%	
Capewell 15%	
Perfect ....55 & 5%	
Putnam ....20 & 5%	
Star ....30 & 5%	

NETTING, POULTRY.

Galvanized before weaving	45-10%
Galvanized after weaving	45%

NIPPERS.

Nail Cutting. V. & B. No. 30	78c
Double Duty. V. & B. No. 60	76c
Hoof. Heller's ....40 & 10%	
V. & B. No. 52, each	$2 25

NOZZLES.

Hose. Magic ....per doz.	$9 50
Diamond .... "	5 75

OILERS.

Chase Pattern. Brass and Copper 10%	
Zinc Plated ....40 & 5%	
Railroad. Brass ....20 & 5%	
Coppered ....50 & 5%	
Steel. Copper Plated ....70 & 5%	

OPENERS.

Delmonico ....per doz.	$1 30
Never Slip .... "	65
Crate. V. & B. ...per doz.	$7 25—11 00

PAILS.

Cream. 14-qt. without gauge, ...per doz.	$9 50
18-qt. without gauge, ...per doz.	11 00
20-qt. without gauge, ...per doz.	11 75
Sap. 10-qt., IC Tin ....per doz.	$4 00
12- " " " "	5 50

Stock.

Galv. qts.	14	16	18	20
Per doz.	$9 75	10 75	12 75	14 50

Water.

Galvanized qts.	10	12	14
Per doz.	$5 75	6 50	7 25

KESTER
Acid Core WIRE SOLDER
REQUIRES ONLY HEAT
Sample for Test
Upon Request

CHICAGO SOLDER COMPANY
4201 Wrightwood Ave., CHICAGO, ILL.

CHATTANOOGA, TENN. 216 MARKET ST. SAN FRANCISCO, CAL.

CORTRIGHT METAL SHINGLES

Cortright hand-dipped shingles are first stamped out of prime roofing tin. After this they are immersed in a bath of molten zinc and receive a uniform coating on both sides and on all edges.

We also make shingles stamped from tight-coat galvanized sheet and from tin plate. We paint these either red or green.

CORTRIGHT METAL ROOFING CO.
Philadelphia — Chicago

Steel Ceilings
Side Walls and Cornices

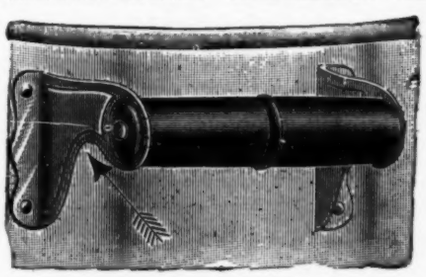
Only first quality material used
Many neat designs of character.

Write today for our complete catalog giving descriptions and prices.

THE W. J. BURTON CO.

Junction Ave. and Federal St. and 436 Penobscot Bldg. Detroit, Michigan

KEYSTONE BOILER HANDLES



WE make a complete line of Boiler Handles.
Also handles for Boiler Covers.
Cut shows No. 40 style.
Let us send you samples.

Complete catalog on request.

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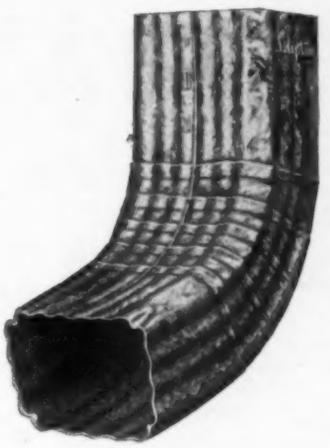

Lupton

Elbows, Conductor Pipe, Eave Trough, Etc.

The superiority of Lupton's Products has been established on the solid basis of quality.

Lupton's Elbows are machine made, in one piece; hence they never vary in size, girth or shape. A replacement is as easy to do as a new job.

The conductor pipe is made full girth, with an ample seam that is tightly locked and sets flat on the back of the pipe.

There's no obstruction in the bead of Lupton's Eave Trough: the connection is easily made.

The use of Lupton's Products saves time and labor and produces a better job.

Made from Armco Iron, Toncan Metal, Horse Head Zinc, galvanized steel and copper.

Order from your Jobber or write for our new catalogue and list prices.

David Lupton's Sons Company
Allegheny Avenue and Tulip Street
Philadelphia

Lupton

"Lupton Elbows FIT"

PARERS.

Apple.
Goodell's .....per doz. $10 80
Turntable ..... " 11 40
White Mountain.. " 8 40
Reading No. 78.. " 11 40

PICKS.

Contractors' 40%
Railroad .....50 & 5%

PINCERS.

All V. & B.
Carpenters', cast steel,
No..... 6 8 10 12
Each $0 43 $0 52 $0 61 $0 71
Blacksmiths', No. 10.....$0 64

PINS.

Clothes.
Common, per box of 5 gro. $0 95

PIPE.

Conductor.
"Interlock" Galvanized.
Crated and nested (all gauges) 60-7½%
Crated and not nested (all gauges) 60-2½%
Square Corrugated A and B and Octagon.
29 Gauge 60-10%
28 " 60-10%
26 " 60-10%
24 " 60-10%

"Interlock."
Crated and nested (all gauges) 60-7½%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove. Per 100 joints.
26 gauge, 5 inch E. C. nested $16 00
26 gauge, 6 inch E. C. nested 17 00
26 gauge, 7 inch E. C. nested 19 00
28 gauge, 5 inch E. C. nested 14 00
28 gauge, 6 inch E. C. nested 15 00
28 gauge, 7 inch E. C. nested 17 00
30 gauge, 5 inch E. C. nested 12 00
30 gauge, 6 inch E. C. nested 14 00
30 gauge, 7 inch E. C. nested 16 00
T-Joint Made up.
6-inch..... per 100 $40 00

Furnace Pipe.
Double Wall Pipe and Fittings 40%
Single Wall Pipe, Round Pipe Fittings 40%
Galvanized and Back Iron Pipe, Shoes, etc....40%
Milcor, galvanized.....40%

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)
Nut, No. 3, each.....$2 60
" No. 5, each..... 64
" No. 25, each..... 69
Gas, No. 7, each..... 55
" No. 8, each..... 61
" No. 12, each..... 87
Lining or Crimping.
No. 35, each..... 64
Button's Pattern.
No. 6 each..... 61
No. 8 each..... 74
Double Duty, No. 106..... 50

POINTS, GLAZIERS'.

No. 1, 2 and 3..per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil handles ..... " 1 10

POKERS, FURNACE.

Each $0 50

PULLEYS.

Sash.
Common .....Net
Common-Sense, 2-in.....Net
Empire Pattern, 2-in.....Net
Ideal .....Net
Steel .....Net
Furnace Regulator, doz. lots, per doz. $0 60

PUNCHES.

Machine. Each.
V. & B., No. 11-13, 1½x6..$0 19
V. & B., No. 90, ⅝x9..... 27
V. & B., No. 10, ¾x10.... 29
V. & B., No. 1-6, ½x6.... 12
Center.
V. & B., No. 50, ⅜x4.....$0 14
Belt.
V. & B., No. 101-103.....$0 24
V. & B., No. 108-109..... 32
V. & B., No. 25, ass't..... 3 80
Samson Line.
No. 1 Hand — Doz. lots or less 40%
No. 2 Hand — 3 doz. lots ...Less 40 & 5%
No. 4 Hand — 6 doz. lots or more...Less 50%
No. 3 Bench — Less than doz. lots...Less 25%; Doz. lots or more...Less 40%

Extra Punches and Dies for Samson:
No. 1 Hand — Less than doz. lots....Less 25%
No. 2 Hand — Doz. lots, ...Less 33⅓%
No. 4 Hand — 3 doz. lots, ...Less 40%
No. 3 Bench — 6 doz. lots or more. ..Less 40 & 10%

PUTTY.

Commercial Putty, 100-lb. kits $2 55

QUADRANTS.

Malleable Iron Damper.....10%

RAZORS—SAFETY.

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 3 40
Gem (3 doz. lots).. " 3 00
Every Ready ..... " 3 40
Ever Ready (3 dz. lots) " 3 00

RAZORS STRAIGHT.

RAZOR STROPS.

Star (Honing) 50%

FLOOR REGISTERS AND BORDERS.

Cast Iron 20%
Steel and Semi-Steel.....33⅓%
Baseboard 33⅓%
Adjustable Ceiling Ventilators 33⅓%

Register Faces—Cast and Steel
Japanned, Bronzed and Plated.
4x6 to 14x14.....33⅓%
Large Register Faces—Cast, 14x14 to 38x42.....60%
Large Register Faces—Steel, 14x14 to 38x42.....65%

ROOFING.

Per Square
Best grade, slate surf. prep'd,$1 80
Best talc surfaced..... 2 05
Medium talc surfaced..... 1 40
Light talc surfaced..... 75
Red Rosin Sheathing, per ton 75 00

ROPE.

Cotton.
¼, 5-16 in. and larger, per lb.....60c to 60c
Sisal.
1st Quality, base 14½c to 16½c
No. 2 .....13½c to 15c
Manila.
1st Quality standard brands .....18½c to 20½c
No. 2 .....17c to 18½
Hardware Grade, per lb. 17½c

SAWS.

Butchers'.
Atkins No. 2, 14-in.....$12 75
" No. 2, 18-in..... 14 20
" No. 7, 16-in..... 15 85
" No. 2, 22-in..... 15 92
" No. 7, 20-in..... 18 05
" No. 7, 24-in..... 20 20
" No. 7, 28-in..... 22 35
Compass.
Atkins No. 2, 10-in.....$ 5 45
" No. 10, 10-in..... 5 60
" Blades, No. 2, 10-in. 3 25
" " No. 2, 10-in. 3 30
Cross-Cut.
Atkins No. 221, 4 ft.....$3 03
" No. 221, 6-ft..... 4 45
" No. 221, 8-ft..... 6 07
Hand.
Copper Burrs only.....30%
" No. 86, 20-in..... 21 70
Hand and Rip.
Atkins No. 84, 20-in.....$19 50
" No. 54, 26-in..... 24 40
" No. 53, 16-in..... 18 10
" No. 53, 20-in..... 22 90
" No. 53, 24-in..... 26 60
" No. 53, 28-in..... 31 45
" No. 53, 30-in..... 34 15
Keyhole.
Atkins No. 1, complete.. $3 10
" No. 2, complete.. 3 70
Miter Box.
Atkins No. 1, 4x20.....$32 65
" No. 1, 5x22..... 38 00
" No. 1, 6x22..... 42 20
Pruning.
Atkins No. 20, 12-in.... $ 8 45
" No. 10, 16-in.... 18 15
Wood.
Atkins No. 202.....$ 7 19
" No. 318..... 8 75
" No. 906..... 15 50
" No. 1509..... 16 56

SCRAPERS.

Box.
No. 6, six blades each.... 25c
Hog.
No. 6, each..... 25c
Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast Iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Jack.....Standard List 45%
gimlet pointed.....50-5%
gimlet pointed.....40-10%
Wood.
F. H. Bright 80%
R. H. Blued 78%
F. H. Jap'd 74%
F. H. Brass 76%
R. H. Brass 74%
Sheet Metal.
No. 7, ½x ¼, per gross.$0 55
No. 10, ¾x3/16, per gross. 75
No. 14, ⅞x ¼, per gross. 90

SCREW DRIVERS.

Uncle Sam Standard Head.
3 inches, each.....$ 45
5 inches, each..... 52
8 inches, each..... 68
12 inches, each..... 1 02
Uncle Sam Insulated Head.
3 inches, each.....$ 49
5 inches, each..... 57
8 inches, each..... 76
12 inches, each..... 1 14

SETS.

Nail.
V. & B.
No. 100, in cardboard boxes .....doz. $1 55
No. 100, in wooden boxes, ... doz. 1 55
No. 30, assorted.....doz. 39
No. 5, in cardboard boxes, ... doz. 1 25
No. 5, in wooden boxes, ... doz. 1 30
Rivet.
V. & B.
Farmers' $0 1
Tinners' 3-4 ..... 0 40
" 00-0..... 0 60
Saw.
Atkins No. 10....per doz. $3 80
" No. 12.... " 6 20

SHEARS.

Per Doz
Nickel Plated, Straight, 6" $12 90
" " " 7" 14 85
" " " 8" 16 80
Japanned, Straight ....6" 11 00
" " ....7" 12 40
" " ....8" 13 80

SHEARS, TINNERS' & MACHINISTS'.

Viking $22 00
Lennox Throatless.
No. 18 .....35%
Shear blades.....10%
(f.o.b. Marshalltown, Iowa.)
Peerless Steel Squaring.
Foot Power.
No. 1—30", 18 ga. cap.....15%
No. 2—36", 18 ga. cap.....15%
No. 4—52", 18 ga. cap.....15%
No. 10—120", 22 ga. cap...15%
No. 4A—52", 16 ga. cap....15%
Cast Iron Foot Power.
No. 01, 30", 18 ga. cap....15%
Power Driven.
(No. 100 Series, 2 Shaft Drive.)
No. 142—42", 18 ga. cap....15%
(No. 200 Series, 2 Shaft Underneath Drive.)
No. 242—42", 14 ga. cap...15%
(No. 300 Series, 3 Shaft Underneath Drive.)
No. 342—42", 10 ga. cap....15%
No. 372—72", 10 ga. cap....15%
(No. 500 Series, 3 Shaft Underneath Drive.
No. 596—96", 10 ga. cap...15%
(No. 600 Series, 3 Shaft Underneath Drive.)
No. 6120—120", 3/16" cap..15%

SHEAVES, SLIDING DOOR.

Common.
Inches 3 4 5
Per set $1 40 1 75 2 40
Hatfield's.
Per set $1 80 2 10 2 75 25

SHINGLES.

Per Square
Zinc (Illinois) $18 00

SHOES.

Milcor.
Galv. Std. Gauge. Plain or corg. round flat crimp...60%
26 gauge round flat crimp..40%
24 gauge round flat crimp..10%
Conductor 60%

SHOVELS AND SPADES.

Coal.
Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's.

Size	A	B	C
14"	$17 15	$16 40	$15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 35
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.
D-Handle .....per doz. $2 50
Long Handle ..... " 3 00

SIFTERS.

Genuine Hunters, doz.....$2 50

SKATES.

Roller.
Ball Bearing—Boys' $1 55
Ball Bearing—Girls' 1 65

Have you seen
THE BIG VENT
WITH THE GREAT PULL?
ÆOLUS
VENTILATOR
RIGID — STRONG — DURABLE

Made in all sizes of all metals. They are reasonably priced and we make *quick* shipments.

ÆOLUS DICKINSON CO.
Vent Makers Since 1888
3332-3352 South Artesian Ave. CHICAGO, ILLINOIS
Telephone: Lafayette 1862-1863

DURABLE
are
Inland Copper Alloy Sheets
BLACK
GALVANIZED
BLUE ANNEALED

INLAND STEEL COMPANY
38 South Dearborn St., Chicago
Works: Indiana Harbor, Ind. Chicago Heights, ILL.
Branch Offices Milwaukee St. Louis St. Paul

"STANDARD"
THE
Ventilator

IS of the rotatable type and swings absolutely free in the slightest draft. The construction is scientifically correct and unusually strong. It works perfectly in all kinds of weather and handles 50% more air than stationary ventilators of equal size. Order from your jobber. Write for our catalog and prices today.

Manufactured by
STANDARD VENTILATOR CO.
LEWISBURG, PA.

AREX
CONTINUOUS EXHAUST

BECAUSE of their scientific design Arex Ventilators exert a powerful siphonage action at all times. They have no moving parts, are storm-proof rigid, light, strong and easily installed. Large sales with more profits are yours with Arex. Write for catalog, prices and discounts.

AREX COMPANY
J. C. Kernchen, Pres.
1581 Conway Building Chicago
THE ORIGINAL SIPHONAGE VENTILATOR

QUALITY & BEAUTY IN ART METAL CEILINGS *AND* SIDE WALLS

QUALITY—only first quality material is used in making **FRIEDLEY-VOSHARDT ART METAL CEILINGS AND SIDE WALLS.**

BEAUTY—is necessary for the ***complete*** and ***lasting*** satisfaction of your customers.

Having one of the finest equipped sheet metal plants in the country and employing only skilled workers enables us to serve you with ***QUALITY*** goods having the ***BEST DESIGNS.***

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CHICAGO, ILLINOIS

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Rolling Mills and Office, PITTSBURGH, PA.
Manufacturers of
SHEET COPPER, BOTTOMS, ROLL COPPER, TINNED AND POLISHED COPPER, NAILS, SPIKES, RIVETS, CONDUCTOR PIPE, EAVES TROUGH, ELBOWS, SHOES, MITRES, ETC.
Branch Warehouses in New York Chicago and St. Louis

Plecker's Galvanized Eave Trough and Corrugated Expanding Conductors

Made of Keystone Copper Bearing Steel

Costs no more Lasts Longer Therefore Cheaper

CLARK-SMITH HARDWARE CO. PEORIA, ILLINOIS

SNIPS, TINNERS'.

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Mitre..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.
Barbed .....per lb. 21@22c
Butter, Tub..... " 16@19c
Fence—
Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15
Netting.
Galvanized ...per 100 lbs. $6 54
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50 & 10%
Extra heavy 35%

STONES.

Axe.

Hindostan	per lb.	New Nets
More Grite	"	"
Washita	"	"

Emery.
No. 126.....per doz. New Nets
Oil—Mounted.

Arkansas Hard No. 7.....	per doz.	New Nets
Arkansas Soft.	"	"
Washita No. 717	"	"

Oil—Unmounted.

Arkansas Hard	per lb.	New Nets
Arkansas Soft.	"	"
Lily White....	"	"
Queer Creek...	"	"
Washita	"	"

Scythe.

Black Diamond	per gro.	New Nets
Crescent	"	"
Green Mountain	"	"
LaMolle	"	"
Extra Quinnebog	"	"
Red End	"	"

STOPS, BENCH.

No. 10 Morrill pattern .....per doz. $11 00
No. 11 Stearns pattern ..... " 10 00
No. 15 Smith pattern ..... " 7 00

STOPPERS, FLUE.

Common .....per doz. $1 10
Gem, No. 1..... " 1 10
Gem, flat, No. 3... " 1 00

STRETCHERS.

Carpet.
Bullard's .....per doz. $3 90
Excelsior ..... " 5 25
Malleable Iron.... " 70
Perfection ..... " 6 30
King ..... " 4 50
Wire.

O. S. Elwood, No. 1	per doz.	Nets
O. S. Elwood, No. 2,	"	"

SWIVELS.

Malleable Iron.....per lb. $0 10
Wrought Steel.....per gro. 4 50

TACKS.

Bill Posters' 6-oz. 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15½c

TAPES, MEASURING.

Asses' Skin .....List & 40%

THERMOMETERS

Tin Case...per doz. 80c & $ 1 25
Wood Backs " $2 00 & 12 00
Glass ..... " 12 00

TIES.

Bale.
Single Loop, carload lots .....75 & 7%
Single Loop, less than car lots .....70 & 15%

TRAPS.

Mouse and Rat. Per Gross.
Sure Catch Mouse Traps.$ 2 10
Vim Mouse Traps..... 2 10
Short Stop Mouse Traps. 1 80
Wood Choker Mouse Traps, 4 hole..... 10 25

Per Doz.
Sure Catch Rat Traps....$0 90
Dead Easy Rat Traps.... 1 00

Baskets.
Packed in One Bushel Band Stave
List per Bushel.
Sure Catch Mouse Traps (360 Traps) .....$ 5 25
Short Stop Mouse Traps (360 Traps.)..... 4 50
Sure Catch Rat Traps (54 Traps) 3 60
Short Stop Rat Traps (54 Traps) 3 15

Assorted Mouse and Rat Traps.
List per Bushel.
Sure Catch (216 Mouse Traps and 26 Rat Traps) $4 90
Short Stop (216 Mouse Traps and 26 Rat Traps) 4 25

TROWELS.

Cement.
Atkins No. 6.....$19 50
" No. 9..... 25 50

TWINE.

White Cotton.
Eureka, 4-ply.....per lb. 30c
Jute.
3-ply and 6-ply Bale Lots 22½c

VALLEY.

Milcor .....
Galv. formed or roll.....50-7½%

VENTILATORS.

Standard.....30 to 40%

VISES.

No. 700 Hand, Inches	4½	5	5½
Doz. $11 15	13 00	14 85	
No. 701. Inches	4	5	6
Doz. $11 15	13 00	16 70	

No. 1. Genuine Wentworth, Noiseless Saw...per doz. 9 25
No. 3. Genuine Wentworth, Noiseless Saw....per doz. 12 75
No. 500, All Steel Folding Saw .....per doz. 16 00

WASHERS.

Over ¼ in. barrel lots per 100 lbs.....$6 25
Iron and Steel.

In.	5/16	⅜	½	⅝	¾
	10¼c	9¼c	7¾c	7½c	7 2/5c

WEATHER STRIPS.

Metallic Stitched.
½ in., per 100 ft.....$1 80
¾ in., per 100 ft..... 2 20
Wood and Felt.
⅝ in., per 100 ft.....$1 56
⅞ in., per 100 ft..... 1 56

WEIGHTS.

Hitching .....per lb. Nets
Sash—f. o. b. Chicago
Smaller lots, per ton....$47 50

WHEEL BARROWS.

Common Wood Tray.....$3 75
Steel Tray, Competition.... 4 50
Steel leg, garden..... 6 00

WIRE.

Plain annealed wire, No. 8 per 100 lbs. $2 70
Galvanized barb wire, per 100 lbs. 4 10
Wire cloth—black painted, 12-mesh, per 100 sq. ft... 2 35
Cattle Wire—galvanized catch weight spool, per 100 lbs. 4 60
Galvanized Hog Wire, 80 rod spool, per spool..... 2 98
Galvanized plain wire, No. 9, per 100 lbs..... 4 15

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle,	"	"	6-in..40-10%
"	"	"	8-in..40-10%
"	"	"	10-in..40-10%
"	"	"	12-in..40-10%
Coes Knife-Handle,	"	"	6-in..40-10%
"	"	"	8-in..40-10%
"	"	"	10-in..40-10%
"	"	"	12-in..40-10%

Coes All Patterns.....40-10%

WRINGERS.

No. 790, Guarantee	per doz.	$49 50
No. 770, Bicycle ...	"	47 00
No. 670, Domestic..	"	43 50
No. 110, Brighton...	"	39 00
No. 750, Guarantee..	"	51 00
No. 740, Bicycle....	"	48 50
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